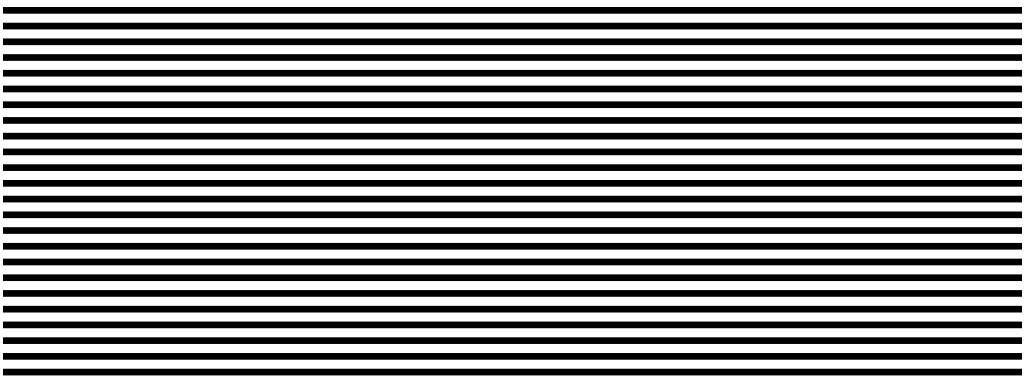
FUJITSU

PagePrinter Network Adapter: Utilities & Environments



Ethernet C, D Utilities & Environments

For use with:

TCP/IP networks

Windows 95/NT operating systems

Novell NetWare networks

The contents of this manual may be revised without prior notice and without obligation to incorporate changes and improvements into units already shipped.

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C145-E207-02EN, June 1997

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Preface

Introduction

Thank you for buying this multi-protocol Network Adapter. You can use this guide to learn how to install and configure utilities so that your printer works with:

- TCP/IP networks
- Windows 95 operating systems
- Windows NT operating systems
- Novell NetWare networks

Terminology

In this book, the term *utilities* refers to the files on the CD-ROM or diskettes that you received with the printer.

The term *adapter* refers to this Network Adapter.

The term *adapter list* refers to the list of adapters on your network that the utility displays.

Conventions used in this book

- Steps requiring action are shown in **bold** print.
- Words or phrases requiring emphasis or explanation appear in *italic* print.
- This book and the on-line Help information use slashes (/) to show the path you should follow through the menus and commands.

  For example, suppose you want to print the adapter list to a printer. You would choose the File menu, the Print command under File, and the To Printer option. That path is shown as
  File/Print/To Printer.

Getting the utility

The Network Printer Utility will be shipped on CD-ROM or diskettes with the printers.

CHAPTER

1

Overview of the Utilities, the Network Adapter and MarkVision

Introduction

Thank you for buying this multi-protocol Network Adapter. As with most new purchases, you probably have a few questions. We will answer some of them in this introduction for you.

What environments do the utilities run in?

Since each environment is different, please see the appropriate chapter in this manual for more details about versions or levels of operating systems that work with these utilities. The utilities work with the following environments:

- Novell NetWare networks (Windows 95 or Windows 3.1)
- Transmission Control Protocol/Internet Protocol (TCP/IP) networks
- Windows 95 operating systems
- Windows NT operating systems

What levels of software and firmware do I need?

You've received, in this package, the latest level of the utilities that were available when the printer was built.

There is firmware that resides on the adapter itself. This firmware handles communications between the printer, the utility, the adapter, and the network. The firmware is, therefore, the backbone of this product. The firmware resides on the adapter's flash memory, a type of Read-Only Memory that can be erased electronically and reprogrammed.

(To check an effective firmware level, contact your point of purchase.)

To find out which firmware revision level uses your adapter, print a setup page. For help, see "Step 2: print a setup page" on page 2-3.

What is MarkVision?

MarkVision is a utility that allows administrators and users to control and see the status of printers on their networks. In addition, it allows network administrators to:

- automatically configure print drivers. The new bidirectional, network-aware PCL and PostScript Windows drivers can configure themselves with many printers. This allows users to make sure that their application driver settings are correct.
- install MarkVision and print drivers from the network. You can copy the MarkVision setup utility and MarkVision to a network drive and directory. Then users on the network can install print drivers and MarkVision from the network.

You can use MarkVision without slowing down printing because MarkVision controls the printer directly and not within the queuing and spooling mechanism of the network.

Does the adapter work with Windows 95?

Yes. See the Windows 95 chapter in this manual for more information.

Which protocols support which environments?

Protocols are provided to reside in the adapter's firmware. The adapter uses these protocols to receive print jobs off the network. The adapters support these protocols:

- NetWare, used to support Novell NetWare networks.
- TCP/IP, used for TCP/IP networks in many UNIX environments.

Is it possible to turn unused protocols off?

Yes. The Network Adapter is shipped with all protocols active. Using the Network Printer Utility for Windows 3.1 or MarkVision for Windows 95, you can turn off protocols that you don't need.

Each protocol consumes some resource on the adapter and network. If you turn a protocol off, that resource is released. Therefore, to increase throughput on the adapter, we recommend that you turn unused protocols off. For example, if you are not using the TCP/IP protocol you may choose to turn it off. This reduces network traffic.

Is it possible to set a password for this adapter?

Passwords on the Network Adapter work as follows:

- The password protects all the adapter's settings from being changed (for example, nicknames, queue names, file servers).
- The passwords protect the adapter from someone inadvertently or mistakenly changing a setting. The password encryption algorithm is not designed to protect against serious hackers.
- One adapter is assigned one password. That password works across all protocols. Therefore, if you set a password in the NetWare protocol, that same password works for TCP/IP.

Will the adapters accept print jobs from several servers?

Yes. The Network Adapter accepts print jobs from NetWare and TCP/IP, one job at a time. The adapter accepts print jobs in the order they are received: first-come, first-served.

How do I find out about last-minute information?

Each diskette or CD-ROM includes a README file. This file contains late-breaking information and offers tips we may have discovered after printing this guide. Please read this file and use it to help you.

Where can I get help?

You can get help from several sources.

- Use pull-down menus. Each item in the utility's pull-down menus has help enclosed with it. To see that help:

  a **Point and click on the menu that you want help with.**

  b **Press F1.**

  The on-line Help information is thorough, containing more complete information than offered in this guide.

- Each chapter of this manual contains problem-solving information. If the utilities do not run, see the corresponding Troubleshooting section at the end of each chapter.
- If you need more help setting up or operating these utilities, contact your point of purchase.

CHAPTER 2

Using TCP/IP networks

Introduction

Thank you for buying this multi-protocol adapter.

This chapter explains how to set up and use your printer on a Transmission Control Protocol/Internet Protocol (TCP/IP) network using this Network Adapter.

Who this chapter is designed for

This chapter is designed for technical people such as TCP/IP programmers and experienced network administrators. It assumes that you have a good working knowledge of your TCP/IP hardware and software.

What this chapter does

First, it explains how to set an IP address, netmask, and gateway using a BOOTP server. It tells you how to set the address, netmask, gateway, and other information at the printer's control panel.

If you are installing the Network Adapter on a complex network and are also setting up a NetWare environment, set up this environment first. The utility that comes with this environment may be useful to you in TCP/IP, too.

Second, this chapter also explains the firmware integrated into the adapter. This firmware supports the following standard TCP/IP protocols:

- Line Printer Remote/Line Printer Daemon (LPR/LPD)
- File Transfer Protocol (FTP)
- Trivial File Transfer Protocol (TFTP)
- Finger
- BOOTstrap Protocol (BOOTP)
- Telnet

This chapter explains how you can use standard TCP/IP protocols with this adapter. It gives a few programming examples. If you are accustomed to writing your own shell scripts, for example, this chapter can help you.

For more information

This utility guide uses standard TCP/IP protocols. Information about these standard protocols is available in RFCs (Request For Comments). These RFCs contain TCP/IP information that is *not* unique to the Network Adapter.

To obtain an RFC, use FTP services on the Internet as an anonymous user to:

```
nic.ddn.mil
```

Look for the RFC in the */rfc* directory.

For more information about TCP/IP, we recommend a book by Douglas Comer entitled *Internetworking with TCP/IP, Volume I: Principles, Protocols, and Architecture.*

Setup

Before you can use the adapter, you need to set it up. Setup involves a few simple steps:

1. **Checking the physical connections.**
2. **Printing a setup page to use while you set up the adapter.**
3. **Setting the adapter's IP address, netmask, and gateway.**
4. **Verifying the setup.**
5. **Setting a community name.**

The rest of this Setup section tells you how to do these steps.

Step 1: check the physical connections

First you need to make sure that your printer and adapter are installed and working correctly. Check the following items.

- Make sure that the printer you want to use is installed on the LAN with the appropriate Ethernet cable.
- Make sure that the adapter is installed in the printer. Instructions for setting up the printer and installing adapters are shipped with the printer.
- Make sure that the printer is connected to the LAN with the appropriate Ethernet cable.

Step 2: print a setup page

Next you need to print a setup page. *Keep the setup page*. You'll use information from it later.

Printing a setup page

1 **Press the Test button on the adapter until the Test light comes on.**

The Data light comes on, and the adapter sends a page to the printer, similar to the one on page 2-4.

Sample setup page

The Network Adapter setup page looks similar to the example below.

```
Network Card
     Type:                                Ethernet
     EOJ Timeout:                         90
     UAA:                                 00200008A803 0004001015C0
     LAA:                                 000000000000 000000000000
     Part Number, EC:                     1381603, MN_XL_E
     Firmware Revision:                   4.124.1

LPT 1
     NPAP Active, NPAP Mode:              Yes, Auto
     Busy Timeout:                        90
     Printer Type, Port Type:             PP14, Enhanced

LexLink (Active)
     Nickname:                            00200008A803

NetWare (Active)
     Login Name:                          !LEX00200008A803
     NetWare Mode:                        PSERVER

IP (Active)
     BOOTP & RARP Enabled:                No
     Address:                             157.184.8.86
     Netmask:                             255.255.255.0
     Gateway:                             157.184.8.30
```

Step 3: set the IP address, netmask, and gateway

You can set the IP address, netmask, and gateway for this adapter in several ways.

The simplest way to set the information is directly on the printer's control panel. For information about setting the information on the printer's control panel, go to "Setting the information via the printer control panel" on page 2-8.

You may:

- Use a TCP/IP bootstrap protocol (BOOTP), if you have a BOOTP server running on your network. For help, go to "Setting the information using a bootstrap protocol" on page 2-6.
- If you are installing the adapter on a complex network and are also setting up NetWare, run the Network Printer Utility in that environment. You can set the address, netmask, and gateway from that environment.

You may also:

- Set the address using a Remote Address Resolution Protocol (RARP) server running on your network. For help, go to "Setting the information using a RARP server and telnet" on page 2-10.
- Set the address by editing the Address Resolution Protocol (ARP) table on one of your host computers *that is on the same local area network as the adapter.* For help, go to "Setting the information by editing an ARP table and using telnet" on page 2-11.

If the above methods won't work for your network, contact your point of purchase.

Setting the information using a bootstrap protocol

You may set the IP address, netmask, and gateway using a TCP/IP bootstrap protocol (BOOTP), if you have a BOOTP server running on your network.

Make sure the BOOTP server is running on the same LAN segment as the adapter. (Some routers will pass the packets, but many will not. If the BOOTP server is on a different LAN segment, check your router's documentation to be sure packets will cross.)

To set the IP address, netmask, and gateway using a TCP/IP bootstrap protocol:

1. **Find the hardware address for the adapter.** To find the hardware address, look at the setup page for the adapter. The address is labelled *UAA an LAA* on the setup page.

   - If you are using an Ethernet adapter, be sure to use the address in the *right* column. This is the canonical form of the address, circled on the sample setup page on page 2-4.

     Choose the Locally Administered Address (LAA), unless it is 000000000000. If the LAA is 000000000000, choose the Universally Administered Address (UAA).

2. **Set up the BOOTP server.** To do so, edit the BOOTP file on the host computer that is running the BOOTP server. The file is usually located in */etc/bootptab.*

   The file contains information such as the hostname and the IP address. For example, a bootptab record might look similar to this:

   ```
   jdlprt:\
   ht=ether:\
   ha=08005A09E610:\
   ip=9.51.8.212:\
   sm=255.255.255.128:\
   gw=9.51.8.132
   ```

   where the following means:

jdlprt	hostname.
ht=ether	hardware type.
ha=08005A09E610	hardware address.
ip=9.51.8.212	IP address.
sm=255.255.255.128	netmask.
gw=9.51.8.132	gateway.

   If you need help editing the BOOTP file, try the man page that came with your UNIX software. Most popular UNIX workstations contain man pages that help you with tasks like this. You might try *man bootp* or *man bootptab*. If that doesn't work, consult your system's documentation.

3 **Make sure that BOOTP is enabled.**

You can do this from the printer control panel.

To enable BOOTP from the printer control panel, follow these steps:

a **Turn the printer power On (|).**

b **Use the printer control panel to find the menu item *SETUP NETWORK MENU.*** Consult your printer documentation to learn the menu path for your specific printer, or scroll through the control panel menus until you find it.

c **Select *SETUP NETWORK MENU.***

d **Select *Enable BOOTP.***

e **Select *Yes.***

If you are instructed to do so, turn the printer off.

f **When you are finished, select Ready.**

4 **Set up the printer's hostname (network name) in the computer.** To do so, simply define the printer's IP name and address in the */etc/hosts* file or on the name server.

This IP address and hostname must match those you set earlier in the BOOTP file. You may want to use a hostname that is meaningful in your environment (for example, a name that identifies the printer's location).

Setting the information via the printer control panel

If you already know the printer's IP address, netmask, and gateway, you may want to set them at the printer's control panel. *This process sets the address, netmask, and gateway at this printer only and does not update any BOOTP records you have in your server.*

1 **Using the printer's control panel, set the IP address, netmask, and gateway.** If you need help, follow these steps:

a **Turn the printer power On (|).**

b **Use the printer control panel to find the menu item *SETUP NETWORK MENU.*** Consult your printer documentation to learn the menu path for your specific printer, or scroll through the control panel menus until you find it.

c **Select *SETUP NETWORK MENU.***

d **Select *Set IP ADDRESS*, and press *ENTER.*** A screen similar to the following appears**:**

```
IP ADDRESS
000.000.000.000
```

e **Use the MENU button to place the cursor beneath the part of the IP address that you want to set. Then use the plus (+) and minus (-) keys to set the address.**

f **Press *ENTER.***

g **Select *Set IP NETMASK*, and press *ENTER.***

h **Set the IP netmask just as you set the IP address.**

i **Press *ENTER.***

j **Select *Set IP GATEWAY*, and press *ENTER.***

k **Set the IP gateway just as you set the IP address.**

l **Press *ENTER.***

m **Press *READY.*** Your settings take effect when you return to the Ready screen.

If an error message appears on the printer's control panel, go to "Using the printer control panel" on page A-1.

2 **Using the printer's operator panel, make sure that BOOTP is disabled.** We recommend that you leave BOOTP disabled if you are not using it to set IP addresses. If you need help, follow these steps:

   a **Turn the printer power On (|).**

   b **Use the printer control panel to select the menu item *SETUP NETWORK MENU.*** Consult your printer documentation to learn the menu path for your specific printer, or scroll through the control panel menus until you find it.

   c **Select *SETUP NETWORK MENU.***

   d **Select *Enable BOOTP.***

   e **Select *No*.**

      If you are instructed to do so, turn the printer off.

   f **When you are finished, select Ready.**

3 **Set up the printer's hostname (network name) in the computer.** To do so, simply define the printer's IP name and address in the */etc/hosts* file or on the name server.

   This address must match the IP address you set earlier on the printer's control panel. You may want to use a hostname that is meaningful in your environment (for example, a name that identifies the printer's location).

Setting the information using a RARP server and telnet

You may set the IP address using a RARP (Remote Address Resolution Protocol). You must make sure that you are working on the same physical network as the adapter. Then you can set the netmask and gateway with telnet.

To set the IP address, netmask, and gateway using a RARP server and telnet:

1. **Look at the setup page. Find the hardware address. It is labelled *UAA and LAA*.**
   - If you are using an Ethernet adapter, be sure to use the address in the *right* column. This is the canonical form of the address, circled on the sample setup page beginning on page 2-4.
   - Choose the Locally Administered Address (LAA), unless it is 000000000000. If the LAA is 000000000000, choose the Universally Administered Address (UAA).
2. **Look at the setup page. Make sure BOOTP and RARP are enabled.**
3. **Set up the RARP server, following the instructions provided by your host operating system.**
4. **Turn the printer off then on to reset the adapter.**

   The adapter sends a RARP request, and the server responds.
5. **Use telnet to set the netmask and gateway by typing:**

   ```
   telnet ip.address -p 9000
   ```

   where *ip.address* is the IP address you're using, such as 9.51.8.231.
6. **Follow the instructions on the screen to set the netmask and gateway.**

   If you wish to change the address, netmask, gateway, or community name in the future, you may find this telnet function helpful.

Setting the information by editing an ARP table and using telnet

You may set the IP address by editing an Address Resolution Protocol (ARP) table. You must make sure that the computer where the ARP table is edited is on the same physical network as the adapter. The adapter cannot send this information across a router, until the adapter is configured.

Then you can use telnet to set the netmask and gateway.

To set the IP address, netmask, and gateway using an ARP file and telnet:

1. **Look at the printer setup page. Find the hardware address. It is labelled *UAA and LAA*.**

   - If you are using an Ethernet adapter, be sure to use the address in the *right* column. This is the canonical form of the address, circled on the sample setup page printed on page 2-4.

     Choose the Locally Administered Address (LAA), unless it is 000000000000. If the LAA is 000000000000, choose the Universally Administered Address (UAA).

2. **Edit the ARP table to add an IP address.** Make sure you use the dotted form of the IP address, such as 9.51.8.231. Use the commands appropriate to the host operating system. On many computers you would type something similar to the following:

   ```
   arp -s 9.51.8.231 08:00:5A:09:E6:10
   ```

   If you need help and are using a UNIX system, try the man page.

3. **PING the adapter.** This sets the new address on the adapter. For example, you might type something similar to:

   ```
   ping 9.51.8.231
   ```

4. **Use telnet to set the netmask and gateway.** For example, you might type something similar to:

   ```
   telnet 9.51.8.231 -p 9000
   ```

5. **Follow the instructions on the screen to set the netmask and gateway.**

Step 4: verify the setup

You can check to make sure the printer is set up correctly. Just follow these steps.

1. **Make sure your computer is on the same physical network as the adapter.**
2. **Print a test page to verify your settings.** If you need help, go to "Step 2: print a setup page" on page 2-3.
3. **Issue a PING command from your computer, such as:**

   ```
   ping hostname
   ```

   where *hostname* is the hostname that you set in the */etc/hosts* file or on the name server.

If PING does not work correctly, make sure that:

- you are using a unique address.
- the ARP table entry is correct.
- all physical connections are working correctly.
- all bridges and routers are operating correctly.
- the hostname that you pinged matches the hostname that you set in the */etc/hosts* file or on the name server.
- if you set the address, netmask, and gateway using BOOTP, make sure that:
  - Your BOOTP server is configured correctly.
  - The IP address and the hostname are set correctly in the BOOTP file.
- If you set the address, netmask, and gateway from the printer control panel, make sure that:
  - The IP address is set correctly on the printer's control panel. If you need help, see "Setting the information via the printer control panel" on page 2-8.
- If you set the IP address, netmask, and gateway using a RARP server or ARP command and telnet, double-check all your steps. If one of these parameters is wrong, your connection will be lost.

Step 5: set a community name or change TCP/IP information

After you have set the TCP/IP information, you can change it using any of the ways you set the information, or by doing one of the following. This is also the way to set a community name.

- Telnet to port 9000 to change the information.

  1. **Type the following at the command prompt:**

     ```
     telnet ip.address -p 9000
     ```

     where *ip.address* is the IP address you're using, such as 9.51.8.231.

  2. **Follow the instructions on the screen.**

- FTP a file to the param directory. The param directory is a special directory where you can change special TCP/IP-related parameters.

  The format of this file should be:

  ```
  PASSWORD: 00000000
  ADDRESS: 9.51.8.50
  NETMASK: .
  GATEWAY: 9.51.8.30
  COMMUNITY: paul
  END
  ```

  - You must put a space after the colon, and the headers must be capitalized.
  - If you want a parameter to remain unchanged, you should type a period for that parameter (such as the NETMASK example above).
  - If you have set a password for the adapter, you must include the password in the file so you'll be able to change the information. If you have *not* set a password for the adapter, substitute a period for the password parameter.
  - The community name must be less than 30 characters long.
  - You must send the file in ASCII mode (not binary).

To ftp to the directory:

1. **Type the following at the command prompt:**

   ```
   ftp ip.address
   ```

   where *ip.address* is the IP address you're using, such as 9.51.8.231.

2. **Type:**

   ```
   cd param
   ```

3. **Type:**

   ```
   put config-file
   ```

   where *config -file* is the name of the file containing the configuration you want to use.

4. **Quit.**

What to do next

You have set up your adapter and are ready to use it.
Continue with "Using the protocols".

Using the protocols

This section explains how to use standard TCP/IP protocols to send jobs to the printer and to check the status of print jobs. It explains how this Network Adapter implements standard TCP/IP protocols such as:

- Line Printer Remote (LPR) programs
- File Transfer Protocol (FTP)
- Trivial File Transfer Protocol (TFTP)
- Finger
- Telnet

Note: The firmware in the Network Adapter includes support for other adapters. The Network Adapter contains only one port (PORT 1) which supports this printer. The multi-purpose firmware in the Network Adapter may make references to port 2 (or IBM 4029 printers), but these statements apply to other types of hardware. Furthermore, any statuses refering to MarkNet XLe should be treated as equivalent statuses of the Network Adapter.

Sending print jobs

You can send jobs to the printer in one of four ways:

- Using a Line Printer Remote (LPR) program that you have already installed. For information about using an LPR program, continue with “Using a Line Printer Remote (LPR) program” on page 2-16.
- Using TFTP (Trivial File Transfer Protocol). For information about TFTP, go to “Using TFTP (Trivial File Transfer Protocol)” on page 2-18.
- Using FTP (File Transfer Protocol). For information about FTP, go to “Using FTP (File Transfer Protocol)” on page 2-19.
- Writing a program that takes advantage of the adapter’s TCP/IP ports. For information about the ports, go to “Checking printer status” on page 2-22.

Using a Line Printer Remote (LPR) program

You may already use Line Printer Remote and Line Printer Daemon (LPR/LPD) programs to send print jobs. The LPR program usually runs on the host computer, sending print jobs and control files to the LPD program running on the print server.

This TCP/IP adapter includes a line printer daemon, which prints previously formatted data files, as received, and ignores the control file. You can use your LPR/LPD program to send jobs to the adapter's line printer daemon.

Using the LPR command

When you use the following options with your LPR command, be sure that:

- *server* is the address (hostname) of this adapter.
- *queue name* or *remote queue name* is the name of the queue that you set up for this adapter. (Some LPR implementations refer to this as the printer name.) See the table below for examples of suffixes you can append to the queue name:

Example	Function
printer_cr	Sends print jobs to the port, and causes the adapter to add a carrier return (or line feed, if appropriate) at the end of each line of text.
printer	Sends print jobs to the port.

- *If your program allows you to send the job as a binary file (for example, with a -b or -v flag), do so. We recommend that all print jobs shall be sent as binary.* Sending binary jobs ensures that all code points are interpreted clearly.

This adapter ignores control files sent to it. Therefore, options contained in the control file do not work. For example, options such as

- those relating to the banner page,
- indentations in the print job, or
- mail sent after the job

do not work.

Note: A queue name may end with any character except "2". If you used a "2" at the end of a queue name, your print jobs will not be printed. Under Windows, you can avoid this error by doing one of the following.

(1) Set "_cr" at the end of the queue name in Windows NT, or

(2) Select the Carriage Return and Linefeed insertion mode in "Set lpd options" when you go into the Main Menu of the Adapter under the program Telnet.

By doing one of the two above mentioned, the Adapter will add the Carriage Return and Linefeed codes automatically to your print job.

LPR time-outs and retry periods

Some LPR programs wait only a limited amount of time to send their print files. If you receive a timeout message from your host, the adapter was probably printing a long job. You should retry the print job.

The adapter supports a finite number of active LPR connections at a time. If more than this number of connections are attempted, the extra attempts will not work. Many UNIX programs retry the print job after a specified amount of time. If you want to use several active LPR connections, we recommend that you set a short retry period so that print jobs will be sent until they are accepted.

Some UNIX systems may default to a 15-minute retry period. We recommend that you use the lp-system command to set a shorter retry period for those computers. You can also telnet to port 9000, then follow the instructions on the screen.

LPSTAT and LPQ commands

Most line printer status (LPSTAT) commands work as usual with this adapter.

We recommend that you use the finger command to get the status of the printer, rather than a line printer query (LPQ) command. Finger returns much more useful information to you than the LPQ command.

If you need information about using finger to get the printer status, see “Using Finger” on page 2-22.

Using telnet to add carrier returns or line feeds to all LPD print jobs

You can use telnet to change the LPD protocol so that it automatically adds carrier returns or line feeds to all print jobs. You may find this helpful if you are printing text files without graphics.

1. **Type the following at the command prompt:**

   ```
   telnet ip.address -p 9000
   ```

   where *ip.address* is the IP address you’re using, such as 9.51.8.231.

2. **From the menu that appears, select *Set lpd options*.**

3. **Follow the instructions on the screen.**

Using telnet

You can use telnet with the adapter. This is an easy way to set the adapter's parameters.

1. **Set up the host to telnet in line mode, with local echo, and with cr/lf conversion.** (Most hosts use this configuration as the default.)
2. **If a password is set for the Network Adapter be sure you know it.**
3. **Type the following at the command prompt:**

   ```
   telnet ip.address -p 9000
   ```

   where *ip.address* is the IP address you're using, such as 9.51.8.231.
4. **Follow the instructions on the screen.** You can work with many adapter parameters and take different actions using the Network Adapter. For example:
   - Set the address, netmask, and gateway
   - Set the community name
   - Set a password
   - Set lpd options (such as automatic carriage returns, banner page, etc.)
   - Assign lpd queue names
   - Enable or disable BOOTP, RARP, FTP, and TFTP
   - Set the maximum transmission size
   - Set up a list of restricted servers

Using TFTP (Trivial File Transfer Protocol)

You can use TFTP to send a job to the printer just as you normally do. Remember that TFTP is slower than FTP.

The Network Adapters ***only*** recognize the TFTP destination file name:

```
/prt1
```

Example

To use TFTP, type a command similar to this:

```
tftp>put <printfile> /prt1
```

where <*printfile*> is the name of print job you're sending and *prt1* is the destination file.

Time-out period

The TFTP protocol used here includes a 30-second inactivity time-out.

If data is not received from the host for 30 seconds, then the adapter closes the TFTP session and begins listening for a new session. The input/output port to the printer and the print job are also closed. This time-out prevents incomplete print jobs from hanging up in the printer and keeping other jobs from printing.

Using FTP (File Transfer Protocol)

You can use FTP to send a job to the printer just as you normally do. FTP reliably sends files across the network.

The implementation of FTP used here accepts any username and does not require a password.

Network Adapters default to /prt1 as the destination.

You may also use the cd command with a destination filename. For example, you might type

```
ftp>cd /prt1
ftp>put <printfile>
```

where <*prt1*> is the name of the destination and <*printfile*> is the name of the print job you're sending.

Sending a file to the param directory

You may also FTP a file to a special destination: the *param* directory. This is a special directory where you can set special TCP/IP-related parameters. The format of this file is:

```
PASSWORD: 00000000
ADDRESS: 9.51.8.50
NETMASK: .
GATEWAY: 9.51.8.30
COMMUNITY: paul
END
```

You must put a space after the colon, and the headers must be capitalized. If you want a parameter to remain unchanged, you should type a period for that parameter (such as the NETMASK example above). The password can be up to eight characters long. The community name must be less than 30 characters long. You must send the file in ASCII mode (not binary).

Time-out periods

There are two time-out periods that may occur in FTP: one during the control connection and one on the data connection.

The time-out during the control connection is 60 seconds. If the control connection is started and no other command is issued for 60 seconds, then the control session is closed. The adapter sends a 421 reply code (service not available, closing control connection).

The time-out default on the data connection is 90 seconds.

If data is not received from the host for this data time-out period, then the adapter closes the FTP data session and begins listening for a new session. The input/output port to the printer and the print job are also closed. This time-out prevents incomplete print jobs from hanging up in the printer and keeping other jobs from printing.

Writing an FTP shell script

If you have written FTP shell scripts to send print jobs to the printer, you can revise those scripts to be used with this adapter. You may send print jobs to */prt1*. The adapter will respond to the various commands with standard FTP reply codes.

A sample shell script, on page 2-21, shows you what can be done. We do not guarantee that this script will be usable on your computer; it is simply given as an example for you.

This script does as ASCII FTP of files specified on the command line, to the host identified in the variables. This shell takes data from stdin or from the print file you specify on the command line.

You can specify several files on the command line. The *-b* option causes the transfer to occur in binary.

```
#1 /bin/sh
module = $0

USAGE="usage: $module [-b] f1 [f2..fn]"

HOST="silver"
PRT="/prt1"                                     # overriding device default with prt1,
                                                # change this to reflect the desired
                                                # printer, or leave blank for default
USER="printer"

if [ "`echo $1 | fgrep '7'`" |= "" ]            # give help if there is a 7 in parm 1
  then
    echo $USAGE
    exit 1
fi

set -- `getopt b $*`                            # check for 'b' as a command
if [ $? |= 0 ]
  then
    echo $USAGE
    exit 1
fi

XFER="ascii"                                    # default transfer type is ASCII

for i in $*
  do
    case $i in
      -b) XFER="binary",shift,,                 # changing transfer type to binary
      --) shift,break,,
    case
  done

FileList=$*
PutCmds=''

if [ -z "$FileList" ]                           # no files specified??
  then
    echo reading standard input 1 >&2
    cat <&0 >/tmp/p$$                           # put std input to a file
    PutCmds="put /tmp/p$$ SPRT
"                                               # this double quote "MUST" be on this line
else

for i in $FileList                              # generate list of puts
  do
    FileName=$1
    if [ -f $FileName ]                         # make sure the file exists
    then
    PutCmds="${PutCmds}put $FileName $PRT
"                                               # this double quote "MUST" be on this line
    else
      echo "$module: file $FileName does not exist - cannot print"
    fi
  done

fi

ftp -n $HOST <<endofdata 1>/dev/null            #startup FTP, passing parms on stdin
user $USER $pw
$XFER
$PutCmds
bye
endofdata

rm -f /tmp/p$$ >/dev/null 2>/dev/null           # remove the file if it exists

exit
```

Checking printer status

You can check the status of the network printer by using the TCP finger command.

Using Finger

Finger is a TCP protocol that normally displays user information on a local or a reachable host. This adapter uses finger to tell you the status of the printer and the current print job.

For example, you may use:

```
finger info@name
```

where:

info is optional. When you use it, the adapter returns extended information.

name is the IP address or the name stored on the name server or in the */etc/hosts* file. Please note that some UNIX environments require you to use the adapter's name instead of its IP address.

By default, finger returns the status of *all* the ports.

Finger responses

The adapter sends an English response, as shown in the following example.

Example 1

This example shows the response you get from the Network Adapter when you use the *info* option with finger. This particular example shows that a job is printing through the Parallel 1 port.

```
#finger info@9.51.8.211

[9.51.8.211]

Printer Type: LaserPrinter

Print Job Status for ser:
NPA is supported, NPA mode is set to auto
No Job Currently Active
Printer Status: 0 OK

Print Job Status for prt1:
NPA is supported, NPA mode is set to auto
Printing
Print Job Name: TEST.PRT
User Name: Paul
Queue/LPT Name: /PRT1
Server: 9.51.8.30
Network Operating System: FTP
Printer Status: 0 OK

Adapter Information
Adapter Type: Ethernet
Firmware Revision: 139.44.1
Adapter Part Number: 1418622
Adapter EC: 543053
Adapter Address: 10005A101348
IP Address: 9.51.8.211
IP Netmask: 255.255.255.128
IP Gateway: 9.51.8.132
BOOTP Server: 0.0.0.0
```

Updating the adapter's firmware

To update the adapter's firmware, you send a file to the adapter's flash memory, overwriting the existing flash memory. This process is also known as *flashing the adapter.*

You can update the firmware by using TFTP.

To use TFTP, do the following:

1. **Get the flash file you need by contacting your vendor.**
2. **Do NOT turn off (or reset) the adapter or printer during the flash process.** This may damage the adapter. The adapter resets itself after the flash process is finished.
3. **TFTP the file to this destination: /dev/flash.**

Changing the TCP/IP information

After you have set the TCP/IP information, you can change it using any of the ways you set the information, or by doing one of the following:

- Use telnet to change the information.

1 **Type the following at the command prompt:**

```
telnet ip.address -p 9000
```

where *ip.address* is the IP address you're using, such as 9.51.8.231.

2 **Follow the instructions on the screen.**

- FTP a file to the param directory.

The param directory is a special directory where you can change special TCP/IP-related parameters. The format of this file is:

```
PASSWORD: 00000000
ADDRESS: 9.51.8.50
NETMASK: .
GATEWAY: 9.51.8.30
COMMUNITY: paul
END
```

- You must put a space after the colon, and the headers must be capitalized.
- If you want a parameter to remain unchanged, you should type a period for that parameter (such as the NETMASK example above).
- If you have set a password for the adapter, you must include the password in the file so you'll be able to change the information. If you have *not* set a password for the adapter, substitute a period for the password parameter.
- The community name must be less than 30 characters long. You must send the file in ASCII mode (not binary).

Troubleshooting

This section helps you correct problems you may encounter while using the adapter on a TCP/IP network. It describes the problems when:

- Print jobs are waiting in the queue and when the
- Printer is not receiving jobs.

Jobs waiting in the queue

The server does not appear to be sending jobs to the network printer you specified. Jobs are in the queue and appear to be waiting for a long time.

Solution

The printer is probably busy receiving jobs from other servers or from other links.

1. **Double-check the printer to be sure that it is working properly.**
2. **Print a setup page from the adapter.**
   - **Press the Test button until the Test light comes on.** The Data light comes on, and the adapter sends a setup page to the printer.

   If the page prints, then the connection between the adapter and the printer is working correctly. If the page does not print, check all the physical connections.
3. **Look at the setup page.** Make sure the IP protocol is active.

Printer not receiving jobs

The printer is not receiving print jobs.

Solution

1. **Make sure the printer is turned on and is ready.**
2. **Make sure that the adapter is installed properly in the printer. To check this, print a test page.** (This is the test page that you printed when you first set up your printer.) The adapter will be in the list of attachments on the test page. Instructions for printing the test page can be found in your printer's documentation.
3. **Print a setup page from the adapter.**
   - **Press the Test button until the Test light comes on.** The Data light comes on, and the adapter sends a setup page to the printer.

   If the page prints, then the connection between the adapter and the printer is working correctly. If the page does not print, check all the physical connections.
4. **Look at the setup page. Make sure the IP protocol is activated.**
5. **Make sure that the LAN cable is plugged into the printer and into the LAN, and that the network is working properly.**
6. **Make sure that the print queues are properly defined and that the print server is functioning correctly.** Refer to the documentation for your operating system for help.
7. **PING the adapter.**
   - If PING works, send the finger command. Finger should return the printer name with the correct information. If it does not, check the IP address, netmask, and gateway to be sure they are correct. (You can check the address, netmask, and gateway on the printer's control panel or from other Network Printer Utilities.)
   - If PING does not work, check to be sure that the IP Protocol is enabled. (You can check this via the MarkVision utility.) Also, check to be sure that bridges and routers are functioning correctly. Finally, verify all the physical connections between the adapter, the printer, and the network.

     If the IP Protocol is enabled, check the IP address, netmask, and gateway to be sure they are correct. (You can check these on the printer's control panel or from other Network Printer Utilities.) Also, verify all physical connections between the adapter, the printer, and the LAN.

Adapter lights

Different patterns of lights may appear on the Network Adapter. These patterns indicate to you various problems that may occur, to help you diagnose them.

In the following table, find the pattern of lights that is displayed on your adapter, then follow the action described. If you need to call for service, be sure to make a note of the light pattern before you call.

Test	Status	Data	Description/Action
off	on	off	Ready.(Idle.)
off	on	blinking	Processing. Normal operation. Data is being received from a host, or sent to a printer.
on	off	off	Testing. The *first* light pattern indicates that you have pressed the Test button.
off	on	blinking	The *second* light pattern indicates that a setup page is being sent from the adapter to the printer.
off	on	blinking	Updating flash code. The *first* light pattern indicates that the flash code is being downloaded to the adapter.
blinking	blinking	blinking	The *second* light pattern occurs while the adapter is updating the flash code. **Make sure the adapter stays plugged in.** After the adapter goes through its normal start-up tests, it returns to its Ready state.
off	blinking	on	Network error. Check all connections to the network. For example, make sure the network cables are connected.
off	blinking	off	Software error. Turn the printer off then on to reset the adapter. Then try to re-send the print job. If this error persists, call for service.
on	blinking	on	Flash error. Turn the printer off then on to reset the adapter. If the error persists, call for service.

Adapter service

If your adapter needs service:

- Make a note of the light pattern, then contact your point of purchase. The adapter contains no replaceable parts and may need to be returned.
- Make sure that you don’t send print jobs to a non-existent adapter. If you do, print jobs will hang.
- If your adapter is defective and you need to replace it, be sure you delete or hold all queues before removing the adapter from the LAN.

CHAPTER 3

Using Windows 95 operating systems

Introduction

Thank you for buying this multi-protocol adapter. The information in this chapter helps you install and set up your utilities to print to an adapter.

Note: You can not print from DOS.

What you need

To install the Network Adapter and start its operation, you need the following:

1. **Microsoft's Windows 95 operating system installed on your computer.**
2. **The MarkVision Printer Utility for Windows 95.** Support for this Network Adapter is built into the MarkVision utilities. You do *not* need separate Network Printer Utilities; everything comes with MarkVision. The MarkVision Printer Utility for Windows 95 is shipped on CD-ROM or diskettes with many printers.
3. **One of the following installed on your network:**
   - Be sure that the adapter is installed in the printer, and the network cable is connected. See your printer documentation if you need help.

     To check a current firmware level, contact your point of purchase

     To check your firmware level, see “Step 2: print a setup page” on page 2-3.

Installing the MarkVision printer utility

If you already have MarkVision running under Windows 95, skip this section. Go to "Configuring the adapter" on page 3-2.

Installing the utility

If you received the MarkVision Utility with your printer, follow the instructions on the diskette respectively CD-ROM to install it. Be sure you read the README.TXT file (using WORDPAD or DOS EDIT) for last-minute information about the utility.

Configuring the adapter

You must set up the adapter to process Windows 95 print jobs. The information in this section should help you. In addition, please consult the on-line help for the latest information available.

The Network Adapter can process jobs from many different environments (for example, from NetWare networks and TCP/IP networks).

To process NetWare print jobs

You can use NetWare in a Windows 95 environment.

Note: For networks that are exclusively NDS (NetWare 4.x servers with bindery emulation turned off) the initial WIN95 utilities will discover adapters. These adapters will need to be set to RPRINTER mode and assigned to be connected to a PSERVER. Existing Novell utilities (NWADMIN, PCONSOLE, etc.) are then used to create queues and define the PSERVER.

Prerequisites

Make sure your Windows 95 desktop is set up to run NetWare jobs.

From the Control Panel:

1. **Select *Network*.**
2. **Make sure one of these is running:**
   a. **Microsoft client for NetWare Networks**
   b. **Microsoft client with NDS upgrade**
   c. **16-bit Novell client**
   d. **Novell client 32**

Step 1: log on and start MarkVision

1. **Log on as an administrator or print operator.**
2. **Start MarkVision.**

   MarkVision searches for bidirectional printers and displays the search results in its main window.

Step 2: make sure the NetWare protocol is on

The NetWare protocol must be turned on in the adapter for the adapter to process NetWare jobs.

1. **In the MarkVision printer window, double-click on the adapter port you wish to configure for NetWare.**
2. **Look at the tabs that appear. If the NetWare settings tab is present, the protocol is on.** If the NetWare settings tab is absent or grayed out, then you must turn the protocol on.
   - Use the on-line help for information.

Step 3: set (or verify) the adapter's general parameters

1. **In the MarkVision printer window, double-click on the adapter port that you wish to configure.**
2. **Click the *Adapter Settings* tab.**
3. **Set or verify all the general parameters for the adapter and port (such as address, and so forth).**
4. **If you want this Network Adapter to process TCP/IP settings as well, you may want to set the TCP/IP address, netmask, and gateway from this *Adapter Settings* tab.** Simply click the Advanced Settings button, then set the TCP/IP information in the dialog box that appears.
5. **When you finish, select *Apply*.**

Step 4: disable the adapter port

You must disable the adapter port to avoid interfering with incoming NetWare jobs.

1. **Click the *NetWare Settings* tab.**
2. **Disable the port by making sure there is no checkmark in the *Port Enabled* box.**

Step 5: set the NetWare-specific information

1. **On the *NetWare Settings* tab, set the print mode to PSERVER or NPRINTER/RPRINTER.** If you need help deciding which mode to use, see “Deciding whether to use NPRINTER/RPRINTER mode or PSERVER mode” on page 5 -7.
2. **Fill in the other fields on the dialog box to configure the port for NetWare print jobs.** If you need help, click the question mark button, then click the field.
3. **After you finished setting all the fields on this tab, click *Apply*.**
4. **On the *NetWare Settings* tab, click *Manage Queues*.** You’ll be setting up queues for the adapter to service.
5. **In the *Queue Manager* dialog box, select existing queues or create new queues for the adapter to service.** If you need help, click the question mark button, then click the field.
6. **When you finish setting up queues, click *OK*.**
7. **If you are using the Network Adapter, on the *NetWare Settings* tab, click *Advanced Settings*.** Fill in the fields. If you need help, click the question mark button, then click the fields you need help on.
8. **After you finished with the *Advanced Settings* dialog, click *OK*.**

Step 6: enable the adapter port

1. **On the *NetWare Settings* tab, enable the adapter port by putting a check-mark in the *Port Enabled* box.**
2. **Click *Apply* to activate your changes.**
3. **MarkVision asks if you want to reset.** Click Yes if you want to start using the adapter for NetWare print jobs now.

Congratulations! Your adapter is ready to process NetWare print jobs.

To process TCP/IP print jobs

You can use TCP/IP in a Windows 95 environment.

Prerequisites

Make sure your Windows 95 desktop is set up to run TCP/IP jobs.

From the Control Panel:

1. **Select *Network*.**
2. **Make sure TCP/IP is running. If it is not:**
   a. **Select *Add*.**
   b. **Select *Protocol*.**
   c. **Select the *Microsoft TCP/IP* option.**

Step 1: start MarkVision and check the community name

1. **Make sure you know the adapter's community name. The default is *public*.**
2. **Start MarkVision.**
3. **In the MarkVision printer window, double-click on the adapter port that you wish to configure.**

Step 2: set the TCP/IP address, netmask, and gateway for the adapter

1. **If you are using NetWare protocol as well as TCP/IP, you can quickly set this information within MarkVision.**
   a. **Click the *Adapter Settings* tab.**
   b. **Click the *Advanced Settings* button.**
   c. **Set the TCP/IP information in the dialog box that appears.**
   d. **When you finish, select *Apply*.**
2. **If you are not using NetWare, go to "Step 3: set the IP address, netmask, and gateway" on page 2-5, or use the MarkVision on-line help for instructions.**

Step 3: add the adapter to the MarkVision window

If you use version 1.06 follow the steps described below or refer to the Operation Guide of MarkVision coming with the printer you purchased.

By design, TCP/IP devices do not broadcast their presence (as, for example, NetWare objects do). Because of this design, MarkVision has no way to automatically find an adapter and monitor it. Therefore, you must inform MarkVision about adapters that you want it to show in its list.

To add an IP adapter to the list in the MarkVision window:

1. **In the MarkVision printer window, click on the *Configure* option in the pull-down menu.**
2. **Click *TCP/IP Settings.***

   The list of TCP/IP adapters that you want MarkVision to enumerate appears. (The box is empty until you add the first TCP/IP adapter.)
3. **Click *Add Adapter.***
4. **Fill in the IP address that you defined in the previous step.**
5. **Fill in the community name.** The name you specify must match the community name stored inside the adapter. The original community name is *public*.
6. **Fill in the host name field with any name you choose.** This is the name that you use to refer to the adapter.
7. **Click *OK.***

   MarkVision saves the changes in an ASCII file named !MVNETIP.INI.

Step 4: set the adapter's general parameters

1. **In the MarkVision printer window, double-click on the adapter port that you wish to configure.**
2. **Click the *Adapter Settings* tab.**
3. **Set or verify all the general parameters for the adapter and port (such as address and so forth).**
4. **Click *Apply.***

Step 5: verify that the IP protocol is on

The IP protocol must be turned on in the adapter; otherwise, the adapter will not recognize or process IP print jobs.

a **On the *Adapter Settings* tab, click *Advanced Settings*.**

b **In the *Advanced Settings* dialog box, look at the *Set Active Protocols* group.** Make sure the TCP/IP box has a checkmark in it.

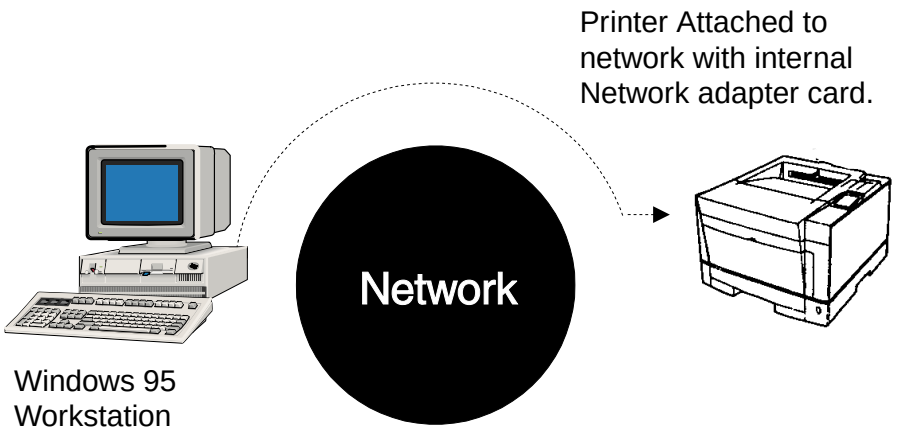
c **When you finish, select *Apply*.**

Congratulations! The adapter is ready to process TCP/IP print jobs. For more information about modifying the list of adapters, continue with "To process Point to Point printing (LexIP)" on page 3-8.

To process Point to Point printing (LexIP)

Point to Point is an easy way for you to print from a Windows 95 workstation to a network-attached printer. It's especially useful in small organizations or departments because you can print without having a server or a network operating system (such as NetWare) installed.

The following drawing shows how print jobs move from a workstation using Point to Point.



MarkVision provides a way for you to print to a network printer when your network uses Microsoft TCP/IP. If you run TCP/IP on your network, you can install Point to Point with MarkVision. Then you can print from Windows applications to a network printer. Point to Point is supported by the adapters. MarkVision can monitor the network printer.

Prerequisites:

1. **You must have MarkVision installed on your workstation.**

   Note: MarkVision does not have to be running for you to print.

2. **The Microsoft TCP/IP DLL must be installed on your workstation.** If it is not installed, use *Custom install* to select *TCP/IP Network Support*.

3. **The TCP/IP protocol must be bound to the network interface card in your Windows 95 computer.** Consult your Windows 95 online HELP for binding an adapter to a protocol (look for Binding in the HELP index), or see the section on "To process TCP/IP print jobs" on page 3-5.

How to configure for TCP/IP protocol:

1. **Assign a TCP/IP address, netmask, and gateway for the adapter.**
   a. **If you have NetWare running on your network, you can quickly initialize the TCP/IP address, netmask, and gateway for the new adapter. Otherwise, you can use BOOTP.**
2. **Add the adapter to the list of TCP/IP adapters you want to see in the MarkVision printer window.**
   a. **In the MarkVision printer window, click *Configure* from the pull-down menus.**
   b. **Click *TCP/IP Settings*.** The list containing TCP/IP adapters that you want MarkVision to monitor appears. (The box is empty until you add the first TCP/IP adapter.)
   c. **Click *Add Adapter.***
   d. **In the *IP address* field, enter the TCP/IP address you defined earlier (step 1).**
   e. **Fill in the *Host Name* field with any name you choose.** This is the name that you use to refer to the adapter. (Other users can have their own host names for the same adapter.)
   f. **Fill in the *Community Name*.** The name you specify must match the community name stored inside the adapter. The original community name is public. The community name is case sensitive.
   g. **Click *OK*.**
3. **Set (or verify) the protocol-independent parameters.**
   a. **In the MarkVision printer window, double-click the adapter port you want to configure.**
   b. **Click the *Adapter Settings* tab.**
   c. **Enter information in the fields to set the various protocol-independent parameters.**
4. **Verify the TCP/IP protocol is turned on in the adapter.**
   a. **Still using the *Adapter Settings* tab, click *Advanced Settings*.**
   b. **Make sure the *TCP/IP* check box in the *Set Active Protocols* group has a check mark in it.**

How to print Point to Point:

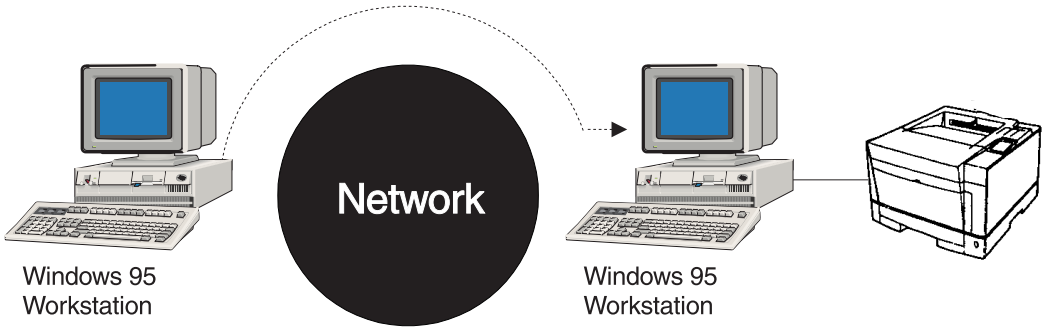
1. **Create the printer object:**
   a. **In Windows 95, click *Start*, then click *Settings*, then *Printers*.**
   b. **Double-click *Add Printer* to define the printer you want to use.**
   c. **Choose *LOCAL* (not NETWORK) printer.**
   d. **Select the appropriate manufacturer and printer.**
   e. **Choose any port (LPT or COM or FILE).** Later you change the port to a logical network port.
2. **Assign the printer object to the physical printer.**
   a. **After the printer object is added to your printer container, highlight it's icon.** Optionally, double click on it with the right mouse button.
   b. **Click *File*, then *Properties*, then *Details* tab, then *Add Port*.**
   c. **Click *Others*, then click *Network Printer Monitor*, then click *OK*.**
   d. **Select the printer you want to use.** The printer list was generated using MarkVision.
   e. **Specify a logical port name to assign to the printer.** Use a port name that is meaningful to you. Click *OK*.
3. **Print**
   a. **To print a test page, use Windows 95, then *Start*, then *Settings*, then *Printer*, then *File*, then *Properties*, then *General* tab, then *Print Test Page*.**
   b. **To print from a Windows application, select *Print* as usual.**

   Note: You can not print from DOS.

To process Peer to Peer printing

Peer to Peer is an easy way for you to print from a Windows 95 workstation to a printer locally connected to a network attached personal computer. A Peer to Peer network consist of personal computers linked together so that a computer can share the hardware and software resources of the other computers on the network. You can print from Peer to Peer in a Windows 95 environment.

The following drawing shows how print jobs move from a workstation using Peer to Peer.



MarkVision provides a way for you to print to a local printer connected to a network attached computer when your workstation uses Windows 95 as an operating system. Peer to Peer requires that print sharing be enabled on the computer that has the locally attached printer and that the printer be shared. MarkVision requires Peer to Peer to be installed to monitor the printer.

Prerequisites

1. **The standard Windows 95 Client for Microsoft Networks client must be installed to provide the ability to logon to the Peer to Peer network.** This is the standard configuration.

   Note: MarkVision does not have to be running for you to print.

2. **The standard *Windows 95 File and Print Sharing* for Microsoft Networks must be installed and configured to allow the workstation to share its printers across the network.**

3. **In order for MarkVision to monitor the printer it is required as a minimum that the following components are custom installed.**

   a. **MarkVision Printer Utility.**

   b. **MarkVision Sound and Default Setup files.**

   c. **MarkVision Peer to Peer client Support.**

   d. **MarkVision Server Support.**

How to print Peer to Peer:

How to share your printer:

1. **To share your locally attached printer with other workstations click the *Start* button on the Windows 95 screen.**
2. **Point to *Settings,* and then click *Printers.***
3. **In the *Printers* window, click the printer you want to share.**
4. **On the *File* menu, click *Sharing.***
5. **Click the options you want.**

How to enable print sharing:

1. **If your workstation is set to use a network, the *Network Neighborhood* icon appears.** In *Network Neighborhood*, locate and double-click the computer where the printer you want to use is located.
2. **Double-click the printer icon in the window that appears.**
3. **To set up the printer, follow the instructions on the screen.**

   Note: You can solve printer problems by using the *Print Troubleshooter* in *Help*.

How to configure MarkVision for Peer to Peer:

1. **In the MarkVision printer window, click *Configure* (pull down menu).**
2. **Click *Peer to Peer Settings.***
3. **In the dialog that appears, you can specify which Peer to Peer workgroups and computers you are interested in.** The locally attached printers in these workgroups/computers will be displayed in the MarkVision printer window.
4. **If you want MarkVision to include your defaults workgroup in the next refresh cycle, make sure the box is checkmarked.**
5. **If there are any other workgroups or computers outside of your default workgroup that you want included in the next refresh cycle, specify these in the fields provided.** Right click the selected field if you need help.
6. **Click *Done* to save your changes.**
7. **Check the MarkVision printer window for Peer to Peer printers.** Look in the CONNECTION column for a string similar to \\JohnsComputer \Q25 (for example).

Troubleshooting

This section helps you correct problems you may encounter while using Network Adapters.

To use this section, find a *Symptom* that describes the problem you are having, then follow the *Solution* listed below.

Windows 95 operating systems

Symptom	Solution
Adapter unable to find the network printer	"Adapter unable to find network printer" on this page.
Print jobs stay in the queue	"Print jobs stay in the queue" on page 3-14.
Print jobs are ending prematurely	"Print jobs are ending prematurely" on page 3-14.

Adapter unable to find network printer

While configuring the adapter, the utility is unable to find the network printer (that is, the network printer does not appear in the adapter list).

Solution

1. **Make sure the printer is turned on and is Ready.**
2. **Make sure the adapter is installed properly.**

   To find out, print a test page. (This is the test page that you printed when you first set up your printer.) The adapter will be in the list of attachments on the test page. Instructions for printing the test page are in your printer's documentation.

   Make sure the protocol you're using is activated.

   a. **On the *Adapter Settings* tab, click *Advanced Settings.***
   b. **In the *Advanced Settings* dialog box, look at the *Set Active Protocols* group.** Make sure the TCP/IP box has a checkmark in it.
   c. **After you finished, select *Apply.***

3. **Make sure the status light on the adapter is on.**
4. **Make sure all routers are configured properly.**

Print jobs stay in the queue

The server does not appear to be sending jobs to the network printer you specified.

Solution

1. **The printer is probably busy receiving jobs from other servers or from other links.** Check the printer to be sure it is working properly.
2. **Make sure the adapter is installed properly.**

   To find out, print a printer test page. (This is the test page that you printed when you first set up your printer.) The adapter will be in the list of attachments on the test page. Instructions for printing the test page can be found in your printer's documentation.
3. **Print a setup page from the adapter.** If the page prints, then the connection between the adapter and the printer is working correctly. If the page is not printed out, check all the physical connections.
   - **Press the Test button until the Test light comes on.** The Data light blinks, and the adapter sends a page to the printer.
4. **Look at the setup page.** Make sure the protocol is active.
5. **Make sure you've configured the adapter properly.** If you need help, review the section(s) in this chapter according to your needs.
6. **Make sure the LAN cable is connected to the server while the print job is active.**

Print jobs are ending prematurely

Print jobs are partially printed; the printer stops printing in the middle of a page.

Solution

The adapter stopped receiving data because it believed it had reached the end of a print job.

- If you're using a PostScript printer, check the printer driver's configuration. Increase the print job time-out value there. Try your print job again.

Adapter lights

Different patterns of lights may appear on the Network Adapter. These patterns indicate various problems that may occur, to help you diagnose them.

In the following table, find the pattern of lights that is occurring on your adapter, then follow the action described. If you need to call for service, be sure to make a note of the light pattern before you call.

Test	Status	Data	Description/Action
off	on	off	Ready (Idle).
off	on	blinking	Processing. Normal operation. Data is being received from a host, or sent to a printer.
on off	off on	off blinking	Testing. The *first* light pattern indicates that you have pressed the Test button. The *second* light pattern indicates that a setup page is being sent from the adapter to the printer.
off blinking	on blinking	blinking blinking	Updating flash code. The *first* light pattern indicates that the flash code is being downloaded to the adapter. The *second* light pattern occurs while the adapter is updating the flash code. **Make sure the adapter stays plugged in.** After the adapter goes through its normal start-up tests, it returns to its Ready state.
off	blinking	on	Network error. Check all connections to the network. For example, make sure the network cables are connected.
off	blinking	off	Software error. Turn the printer power off then on to reset the adapter. Then try to re-send the print job. If this error persists, call for service.
on	blinking	on	Flash error. Turn the printer power off then on to reset the adapter. If the error persists, call for service.

Adapter service

If your adapter needs service:

- Make a note of the light pattern, then contact your point of purchase. The adapter contains no replaceable parts and may need to be returned.
- Make sure you don't send print jobs to a non-existent adapter. If you do, print jobs will be stored in the queue.
- If your adapter is defective and you need to replace it, make sure you delete or hold all queues before removing the adapter from the LAN.

CHAPTER 4

Using Windows NT operating systems

Introduction

Thank you for buying this multi-protocol adapter.

This chapter explains how to set up and use your printer on Windows NT operating systems.

To do this, you should have a basic working knowledge of Windows NT.

How to print

The following methods are used to print in a Windows NT environment.

Windows NT 3.51:

(1) printing using the lpr protocol

Windows NT 4.0:

(1) printing using the lpr protocol

(2) printing using the Network Port (TCP/IP ports)

Before you begin

Before you can use the adapter, you need to set it up. Setup involves a few simple steps:

1. Checking the physical connections.

2. Printing a setup page to use while you set up the adapter.

3. Setting the adapter's IP address, netmask, and gateway.

4. Verifying the setup.

If you need help, see "Using TCP/IP networks" on page 2-1.

Printing under Windows NT 3.51

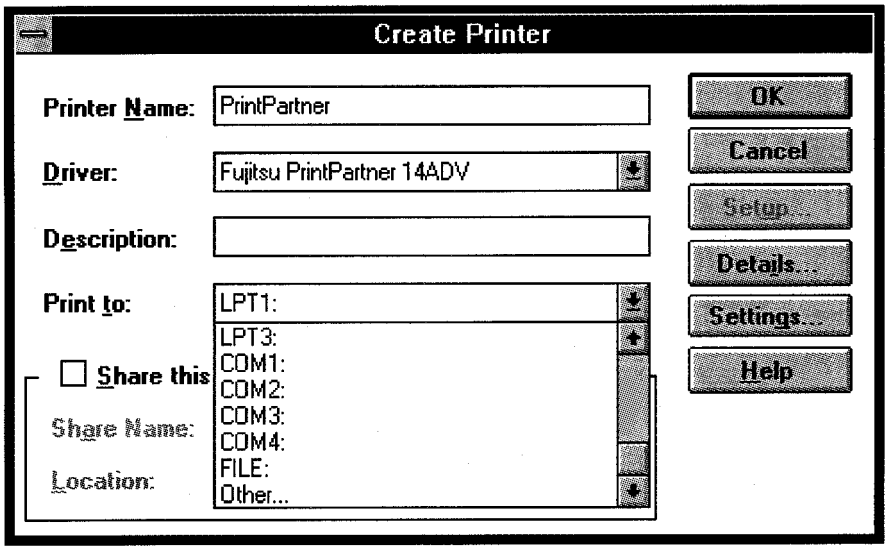
This section explains how to create your printer under Windows NT 3.51 operating systems.

What you need

If you would like to print with using lpr protocol, you need to install ***"TCP/IP Network Printing Support"*** on your Windows NT operating system.

How to Create a Printer using the lpr protocol

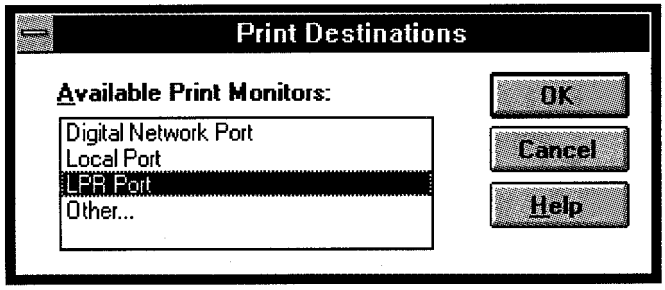
1. **From the Windows NT Program Manager, select the Main program group.**
2. **Select *Print Manager.***
3. **Select *Printer.***
4. **From the *Printer* menu, select *Create Printer.*** The Create Printer dialog box appears.



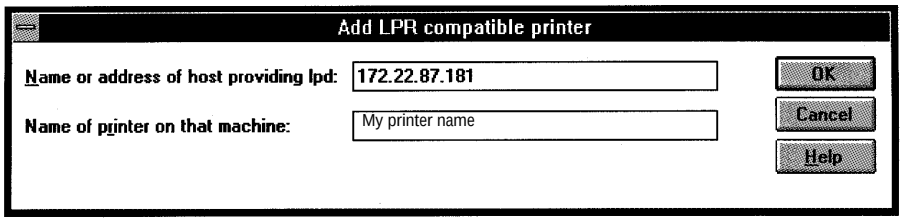
   a. **In the *Printer Name* field, type the name that you want to give to the printer.**

   b. **From the *Driver* field, pick a driver that you want to use with this printer.**

   c. **In the *Print To* list box, select *Other.*** The Available Print Monitors dialog box appears.



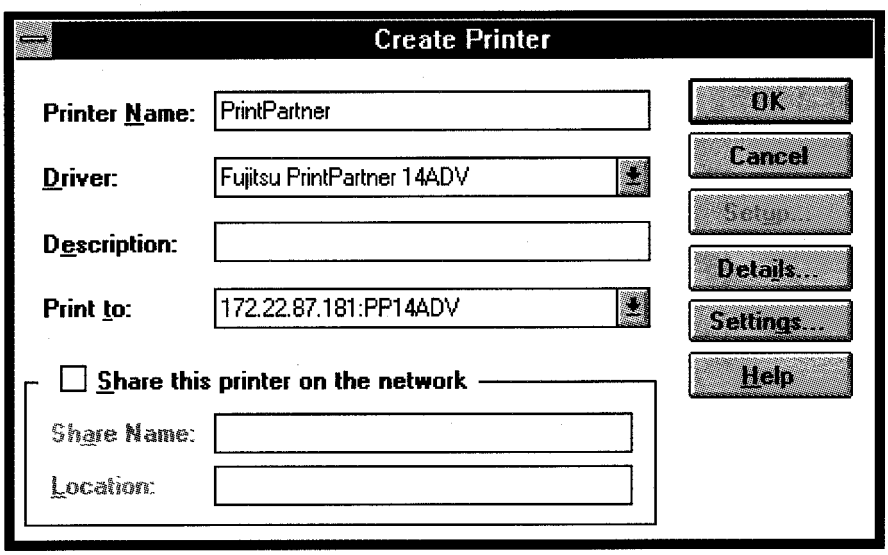
5. **From the *Available Print Monitors,* select *LPR Port.*** The *Add LPR compatible printer* dialog box appears.



   a. **In the *Name or address of host providing lpd* field, type the host name or IP address that you set to the adapter.**

   b. **In the *Name of printer on that machine* field, type the name that you want to give to the printer.**

6. **Click *OK.*** The *Create Printer* dialog box appears.



7. **If you would like to share this printer, select *Share this printer on the network* and type S*hare name* and the *Location* in the respective fields.**
8. **Click *OK*.** Your printer is now created and will appear within Windows NT Print Manager.

Printing under Windows NT 4.0

This section explains how to create your printer under Windows NT 4.0 operating systems.

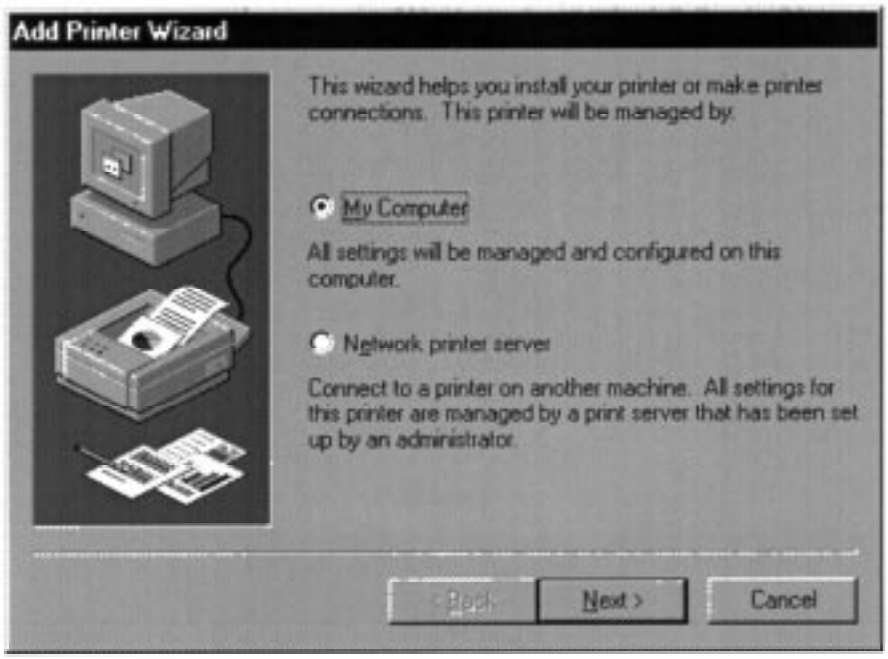
What you need

If you would like to print using the lpr protocol, you need to install *"Microsoft TCP/IP Printing"* on your Windows NT.

If you would like to print using the Network Port, you need to install *"MarkVision for Windows NT 4.0"* on your Windows NT.

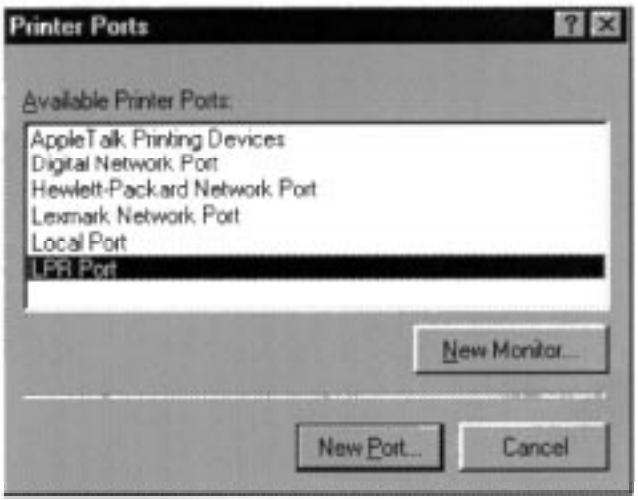
How to Create a Printer using the lpr protocol

1. **In the Windows NT user interface, click *Start,* then click *Settings,* then click *Printers.***
2. **Double-click *Add Printer.***

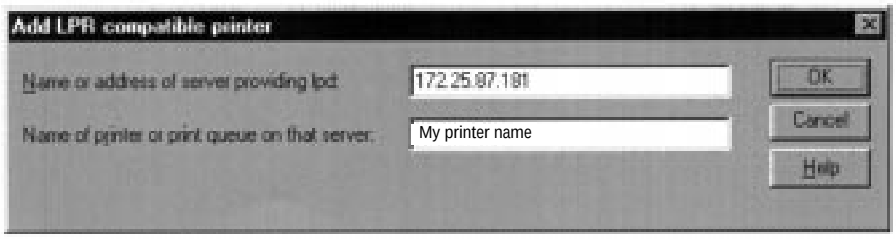


3. **Select *My Computer,* then click *Next.*** The *Available ports* dialog box appears.

4. **Click *Add Port.***



5. **From the *Available Printer Ports,* select *LPR Port,* then click *New Port.***



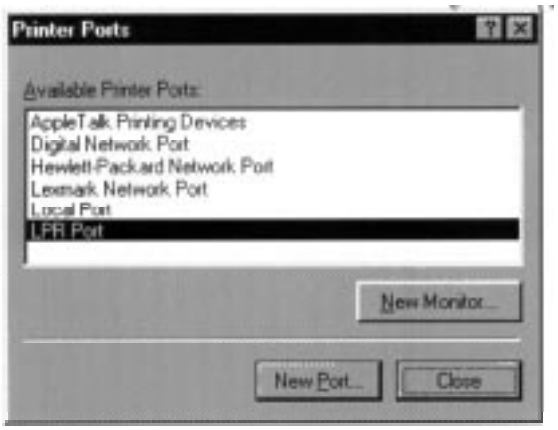
a. In the *Name or address of server providing lpd* field, type the host name or IP address that you set to the adapter.

b. In the *Name of printer or print queue on that server* field, type the name that you want to give to the printer.

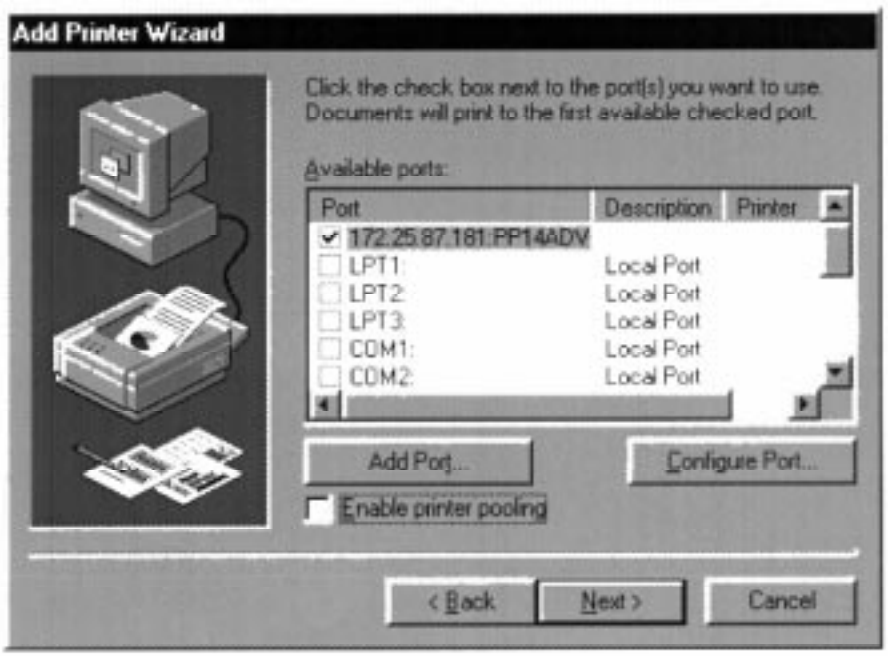
Note:

A printer name or a queue name may end with any character except a "2" or "_CR". If you used a "2" or "_CR" at the end of a printer or queue name, your print jobs will not be printed.

6. Click *OK.* The *Printer Ports* dialog box reappears.



7. Select *Close.* The *Add Printer Wizard* dialog box reappears.



8. **Make sure the port you just created is selected (checked) for this printer object.** Click *Next.*

9. **Choose the correct driver for the printer you want use.** Follow the directions on the screen.

How to Create a Printer using Network Port (TCP/IP ports)

On the CD-ROM or floppy disks included in your printer package, you will also find information on how to set up a printer using a network port (TCP/IP ports).

CHAPTER 5

Using NetWare networks

Introduction

The following instructions work for Network Adapters.

To install this Network Printer Utility, you need to have a basic working knowledge of Novell NetWare networks, especially the Print Server software.

Note: If you are running a multi-protocol network, and you would like to use this NetWare utility to set the TCP/IP address, netmask, and gateway, you'll need to begin here.

Before you begin

Follow the steps below to prepare for the installation.

1. **Look at the README.1ST file on the *NetWare Network Adapter: Network Printer Utility* diskettes respectively CD-ROM before you begin to set up the utility.** This file may contain updates about system requirements or procedures that were not available when this guide was published.
2. **Make backup copies of your new diskettes.** See your operating system documentation if you need help.

What you need

Prerequisites:

1. **One of the following installed:**
   - Novell NetWare Version 3.11 (or higher).
   - Novell NetWare Version 4.01 (or higher). The adapter supports NDS; you do not need to use bindery emulation.
2. **The *NetWare Network Adapter: Network Printer Utility* diskettes respectively CD-ROM.**
3. **One of the following installed in your network:**
   - A Network Adapter. Make sure the adapter is installed in the printer, and the network cable is connected. Instructions for installing the adapter are located in your printer's documentation.

Installing the utility

You can install the Network Printer Utility under Windows 3.1 (following) or Windows 95 (see Chapter 3).

Follow the following steps to install the utility in a Windows 3.1 environment.

You may install the utility as a Stand-alone product, in the program group you choose.

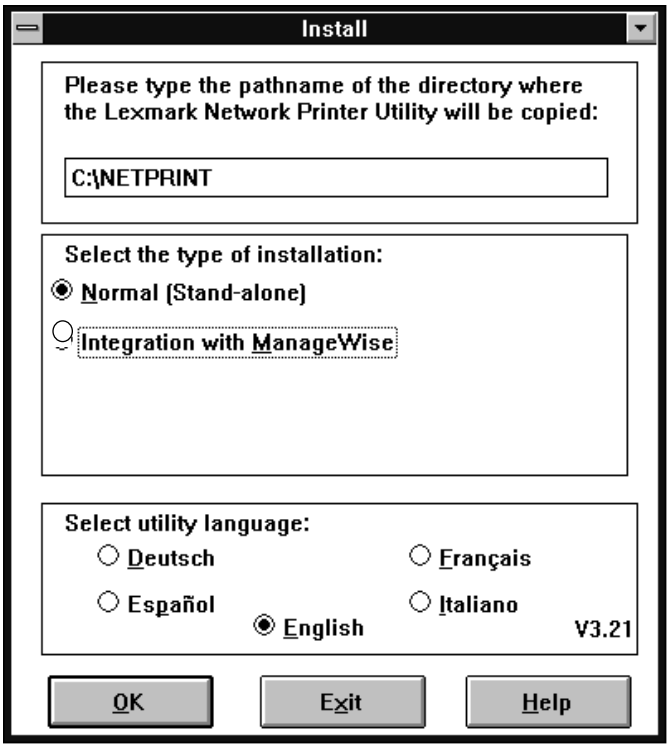
To install the utility:

1. **Insert the *NetWare Network Adapter Network: Network Printer Utility* diskette respectively CD-ROM for Windows 3.1 into drive A.**
2. **From the *Program Manager* window, select *File* from the menu bar, then select *Run*....** The *Run* dialog box opens.
3. **Type the following in the text box, when installing from diskette:**

   ```
   a:\instwin
   ```

4. **Select *OK*.**

The *Install* dialog box opens. It looks similar to the following:



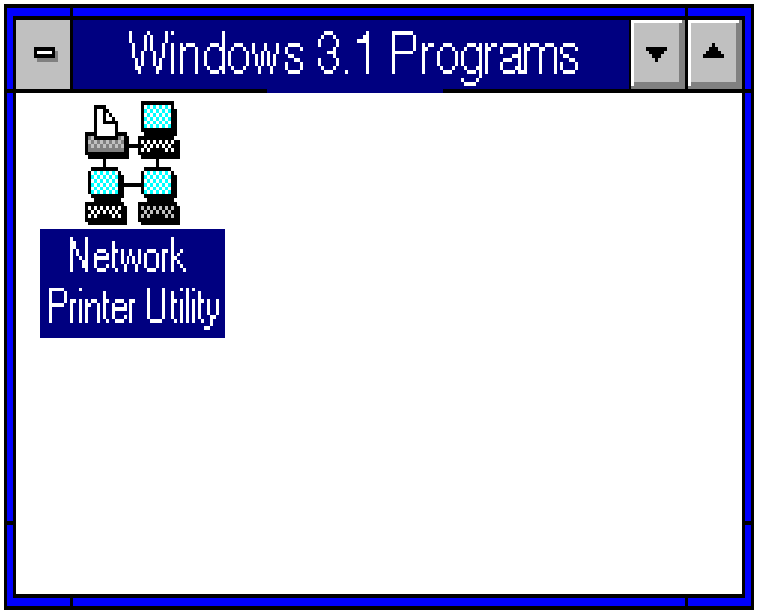
5. **Follow the instructions on the screen.**

Starting the network printer utility

Before you can send print jobs to the adapter, you must start the utility and configure the adapter.

You can start the Network Printer Utility from wherever you installed it under Windows 3.1.

The following screenshot illustrates the way.



Ways to Start the Network Printer Utility

To start the utility:

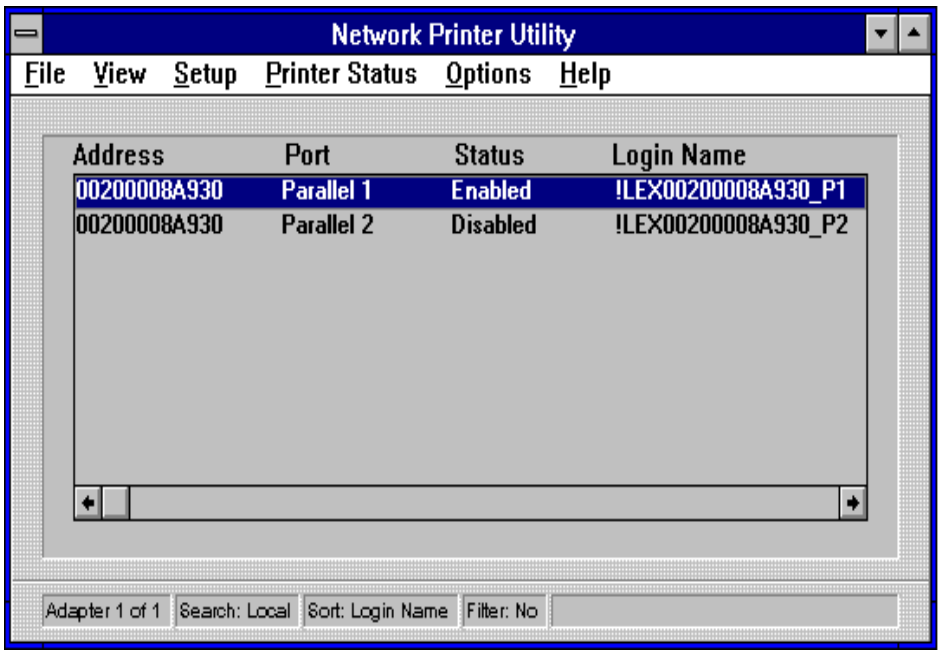
1. **Log in to NetWare as a user with administrator privileges.**
2. **Start the utility.**
   - Go to the Program Group and double-click the Network Printer Utility icon. The icon is shown in the screenshot above.

Using the utility

When you start the utility, its adapter list appears. This list shows all adapters that answer a broadcast. You can't print to the adapters yet, because you have not set them up to receive jobs. You will use the Network Printer Utility (and PCONSOLE, if you prefer) to configure the adapters and monitor them.

Using the adapter list

The adapter list looks similar to this:



To work with the utility:

1. **On the adapter list, point and click on the adapter that you want to work with.**
   - To highlight a range of adapters, hold down the *Shift* key and click the mouse once, at the top and bottom of the range of adapters you want to use.
   - To select individual adapters, hold down the *Ctrl* key, point to each adapter that you want to choose and click the mouse once.
2. **Then use the menu bar to work with the selected adapter.** Notice that the list has six items on the menu bar: *File, View, Setup, Printer Status, Options, and Help*.

For example, to set up an adapter, you first highlight the adapter, then select *Setup* from the menu bar.

The utility has six pull-down menus, on the menu bar. Some of the functions that you can do from the pull-down menus are available for only specific adapters. The functions that aren't available are grayed-out on the screen.

The menu items:

File	View	Setup	Printer Status	Options	Help
• save utility settings • print the adapter list • exit the utility	• search for adapters that will be displayed on the adapter list • change the search broadcast, allowing you to display different kinds of adapter lists • save the search results in a file • change the appearance of the adapter list • refresh the window • sort the adapter list by address, network number, or login name • filter the adapter list	• set up the adapter quickly • change adapter parameters • configure ports • set LAA (locally administered addresses) • reset adapters • enable/ disable ports • set a password • turn other protocols on or off • set TCP/IP information	• see a one-line status of the printer connected to the adapter • see a detailed status of a printer • change the polling interval	• display a list of setup and configuration information about the adapter • see a list of servers the adapter is communicating with • update the flash memory on the adapter	• select various kinds of help informa-tion

Selecting items from the menus

You can access items in several ways:

- Move the mouse pointer to the item you want, and click the left mouse button once.
- Hold down the *Alt* key and type the character that is underlined or in a different color than the rest of the word.
- You can also select an item by using the cursor keys to move the cursor to the item you want, then pressing *Enter*.
- Shortcut keys are also available to access many items on the pull-down menus. For a list of what each key does, see the *Help/Keyboard* pull-down menu.

Setting up the adapter

Now that you have installed and started the utility, you need to set up the adapter so that you can send print jobs to it.

What setup accomplishes

In the process of setting up the adapter, you accomplish two major tasks:

- creating the components, or objects, that NetWare needs to use with the adapter
- configuring the adapter so that it operates in the desired mode (PSERVER or NPRINTER/RPRINTER), and giving the adapter information about its network components

Please note that NetWare 3.x uses the term RPRINTER for setting up a printer in remote printer mode. This same mode is called NPRINTER in NetWare 4.x.

Utilities to use

To set up the adapter, you may use either:

- the Network Printer Utility alone.

  This utility provides all of the functions you need to set up the adapters in a NetWare environment. The utility is designed to meet the needs of a network administrator and can only be started by a person who has network supervisory rights.

  Functions that you may be accustomed to doing from PCONSOLE (such as setting up print queues) can be managed from the Network Printer Utility.

- PCONSOLE or NWADMIN, plus the Network Printer Utility.

  If you are accustomed to using PCONSOLE or NWADMIN to set up NetWare components or objects, you may continue to do so. Then use the Network Printer Utility to configure the adapter.

To set up the adapter

1. **From the Network Printer Utility's menu bar, select *Help*, (even if you want to set up the adapter using PCONSOLE and this utility.)**
2. **From the *Help*'s *Table of Contents*, select *Configuring the Adapter.***
3. **Select the section that is relevant to you.**

Sections devoted to NetWare 3.x and 4.x are listed, including information about PCONSOLE methods of setting up the adapter.

If you need help deciding whether to use PSERVER or NPRINTER/RPRINTER, continue with "Deciding whether to use NPRINTER/RPRINTER mode or PSERVER mode" on this page.

4 **Print those instructions and follow them to set up your adapter.**

What to do next

When you have finished setting up the adapter, continue with "Verifying the adapter setup" on page 5-11.

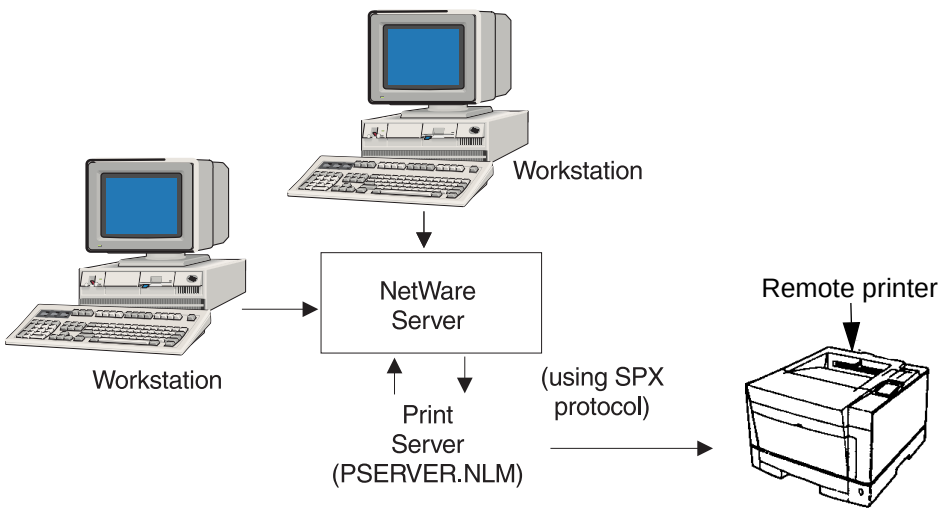
Deciding whether to use NPRINTER/RPRINTER mode or PSERVER mode

When configuring your adapter, you'll have to set it up in either NPRINTER/RPRINTER or in PSERVER mode.

How NPRINTER/RPRINTER mode works

A network adapter configured in NPRINTER/RPRINTER mode acts as a remote printer. This remote printer receives print jobs from a print server. The print server, a program called PSERVER.NLM running on a NetWare server, obtains print jobs from a queue and sends them to the remote printer.

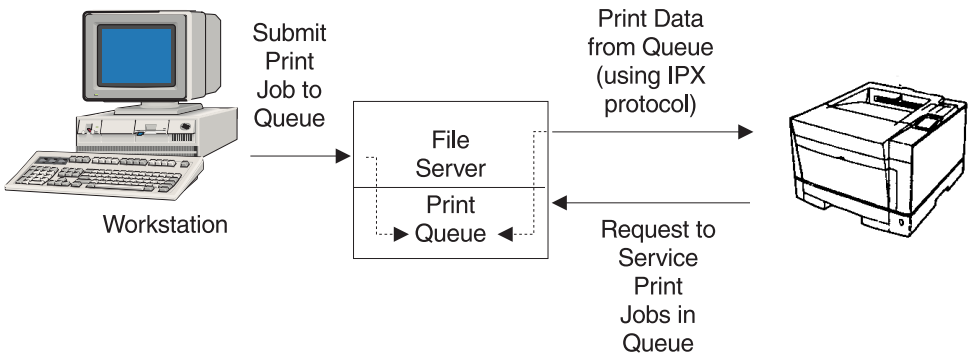
The following diagram shows how NPRINTER/RPRINTER mode works.



How PSERVER mode works

An adapter set up in PSERVER mode acts as a print server attached to NetWare servers. This adapter obtains print jobs from queues located on one or more servers. PSERVER adapters actually log into NetWare servers as a NetWare client and, therefore, require one NetWare user license slot per PSERVER device.

The following diagram shows how PSERVER mode works.



NPRINT versus PSERVER in NetWare 4 NetWare Directory Services (NDS)

Adapters are fully supported in NetWare 4 NDS, using either NPRINT or PSERVER mode. You do not need to use bindery emulation in either mode.

NPRINT mode in NetWare 4 NDS

Advantage of using NPRINT mode in NDS:

- Does not require a NetWare server user license slot

Disadvantage of using NPRINT mode in NDS:

- Little information is available about the print job. After a job leaves a print server queue, it is removed from the queue, regardless of whether it actually prints. This could cause a print job to be lost, if the printer is turned off in the middle of the print job. This is inherent in the NetWare design, and is not a problem caused by the adapter.

Notes about printing performance:

- Many people prefer to configure their network adapters in PSERVER mode, because they are used to it, since in early versions of NetWare PSERVER performance was significantly better than NPRINTER/RPRINTER performance.

This performance difference is smaller for NetWare 4.x. The actual print job throughput is affected by many other factors such as topology, job size and content, and network adapter settings. Under many circumstances, NPRINTER mode provides an excellent NetWare 4.x NDS solution.

PSERVER mode in NetWare 4.x NDS

Advantages of using PSERVER mode in NDS:

- Does not require that PSERVER.NLM is installed on the NetWare server.
- Performance. Although overall print job throughput is affected by many factors, file transfer time on the network may be faster using PSERVER mode because:
  - In NPRINTER/RPRINTER mode, NetWare uses SPX to transfer packets. Packet size for data transmitted in SPX is 512 bytes.
  - In PSERVER mode, NetWare uses IPX to transfer packets. Packet size for data transmitted in IPX is up to 1 Kbyte for Ethernet networks.

Because of this difference in packet size, PSERVER mode may be faster than NPRINTER/RPRINTER mode. Please note, however, that the *actual* IPX packet size is negotiated by the client application. This actual IPX packet size is often less than the maximum because of packet size limitations of gateways and routers.

If printing is a significant part of your network traffic, and if network traffic is a proven concern for your network, you may find it better to use the adapters in PSERVER mode.

Disadvantage of using PSERVER mode in NDS:

- Requires a NetWare server user license for each PSERVER device

RPRINTER versus PSERVER in NetWare 3.x

Adapters are fully supported in NetWare 3.x, using either RPRINTER or PSERVER mode.

RPRINTER mode in NetWare 3.x

Advantage of using RPRINTER mode in NetWare 3.x:

- Does not require a NetWare server user license slot

Disadvantage of using RPRINTER mode in NetWare 3.x:

- Little information is available about the print job. After a job leaves a print server queue, it is removed from the queue, regardless of whether it actually prints. This could cause a print job to be lost, if the printer is turned off in the middle of the print job. This is inherent in the NetWare design, and is not unique to network adapters.

PSERVER mode in NetWare 3.x

Advantages of using PSERVER mode in NetWare 3.x:

- Does not require that PSERVER.NLM is installed on the NetWare server
- Does not require you to unload PSERVER.NLM or reboot your computer after installation
- Performance. Although overall print job throughput is affected by many factors, file transfer time on the network may be significantly faster using PSERVER mode.
  - In NPRINTER/RPRINTER mode, NetWare uses SPX to transfer packets. Packet size for data transmitted in SPX is 512 bytes.
  - In PSERVER mode, NetWare uses IPX to transfer packets. Packet size for data transmitted in IPX is up to 1 Kbyte for Ethernet networks.

Because of this difference in packet size, PSERVER mode may be faster than NPRINTER/RPRINTER mode. Please note, however, that the *actual* IPX packet size is negotiated by the client application. This actual IPX packet size is often less than the maximum because of packet size limitations of gateways and routers.

If printing is a significant part of your network traffic, and if network traffic is a proven concern for your network, you may find it better to use the adapters in PSERVER mode.

- Connects to several file servers and supports many queues:
  - Network Adapter connects to as many as 16 file servers, with a total of 32 queues per adapter, distributed any way you want among the servers

Disadvantage of using PSERVER mode in NetWare 3.x:

- Requires a NetWare server user license slot for each PSERVER device

What to do next

Congratulations! Your adapter is ready to work for you.

You have finished setting up the adapter. To make sure you can print to it, you should test it.

Verifying the adapter setup

To verify that you did everything correctly and that you can print with the adapter and the utility, do the following:

1. **Reset the adapter.** If you need help, follow these steps.
   a. **From the utility's adapter list, select the adapter whose setup you want to verify.**
   b. **On the utility's menu bar, select *Setup/Customized*.**
   c. **Select *Reset Adapter.***
2. **Check the list of servers under *Options* to be sure the servers you set up in the previous step are listed there.** If you need help, follow these steps:
   a. **On the utility's adapter list, select the adapter whose servers you want to check.**
   b. **From the utility's menu bar, select *Options*.**
   c. **Select *Show Adapter's Servers.***
   d. **Check the list of network servers. Make sure the server you want the adapter to work with appears in the list.**
      - If you are using PSERVER mode, make sure you selected a file server to connect with and that you configured queues for that file server.
      - If you are using RPRINTER mode, make sure you selected a print server and configured queues.
3. **Print a page to a queue.** If you need help, follow these steps:
   a. **From the utility's menu bar, select *File*.**
   b. **Select *Print.***
   c. **Select *To Queue*. On the *Print List to Queue* dialog box, select the file server, select the queue, and then choose *Print Adapter List*.**

      If the page doesn't print, review this section. Be sure the adapter is configured properly, is enabled, and that all the queues are set up correctly. Make sure you are logged into the server.

Troubleshooting

This section helps you to correct problems you may encounter while using the Network Adapters regarding their symptoms:

- Utility unable to find the network printer
- Print jobs stay in the queue

Utility unable to find the network printer

While configuring the adapter, the utility is unable to find the network printer (that is, the network printer does not appear in the adapter list).

Solution

1. **Make sure the printer is turned on and is Ready.**
2. **Make sure that the adapter is installed properly.** To check this, print a test page. (This is the test page that you printed when you first set up your printer.) The adapter will be in the list of attachments on the test page. You can find instructions for printing the test page in your printer's documentation.
3. **Make sure that:**
   - The status light on the adapter is on.
   - The adapter is completely connected to the LAN.
4. **Make sure all routers are configured properly.**
5. **Make sure the workstation network drivers are up to date.**
6. **From the Network Printer Utility menu, select *View/Search for Adapters by/Entire Network.***

Print jobs stay in the queue

The server does not appear to be sending jobs to the network printer you specified.

Solution

1. **The printer is probably busy receiving jobs from other servers or from other links. Check the printer to be sure it is working properly.**
2. **Make sure the adapter is installed properly.** To check this, print a test page. (This is the test page that you printed when you first set up your printer.) The adapter will be in the list of attachments on the test page. You can find instructions for printing the test page in your printer's documentation.
3. **Print a setup page from the adapter.** If the page prints, then the connection between the adapter and the printer is working correctly. If the page does not print, check all the physical connections.
   - **Press the Test button until the Test light comes on**. The Data light blinks, and the adapter sends a page to the printer.
4. **Look at the setup page. Make sure the NetWare protocol is active and the proper frame types are set.**
5. **Check the Network Printer Utility to make sure you have:**
   a. Configured the adapter. If you need help, go to "To set up the adapter" on page 5-6.
   b. Enabled the port. If you need help, use the utility's on-line help.
6. **If you are using PSERVER mode, make sure you have:**
   a. Defined the adapter as a print server. If you need help, go to "To set up the adapter" on page 5-6.
   b. Defined print queue names. If you need help, use the utility's on-line help.
   c. Assigned the adapter's login name to service the print queue. If you need help, use the utility's on-line help.
   d. Used Novell's PCONSOLE utility to make sure the queue is not being held.

7 **If you are using RPRINTER mode, make sure you have:**

   a Defined a NetWare server for the adapter to service. If you need help, go to the utility's on-line help.

   b Defined print queue names. If you need help, go to the utility's on-line help.

   c Defined the adapter as a remote printer. If you need help, go to the utility's on-line help.

   d Used Novell's PCONSOLE utility to make sure the queue is not being held.

   e Unloaded the print server, or rebooted the computer, after you configure the utility. (After configuration, you will be prompted to unload PSERVER.NLM or reboot your computer. Be sure you do so.) This is necessary and a normal function of Novell's RPRINTER mode. If you need help, consult your RPRINTER documentation.

8 **If some files stayed in the queues without being printed, then the LAN cable was probably disconnected from the server while the print job was active.** Reconnect the cable, reset the adapter, and try again.

Adapter lights

Different patterns of lights may appear on the Network adapter. These patterns indicate various problems that may occur, to help you diagnose them.

In the following table, find the patterns of lights that is occurring on your adapter, then follow the action described. If you need to call for service, be sure to make a note of the light pattern before you call.

Test	Status	Data	Description/Action
off	on	off	Ready (Idle).
off	on	blinking	Processing. Normal operation. Data is being received from a host, or sent to a printer.
on off	off on	off blinking	Testing. The *first* light pattern indicates that you have pressed the Test button. The *second* light pattern indicates that a setup page is being sent from the adapter to the printer.
off blinking	on blinking	blinking blinking	Updating flash code. The *first* light pattern indicates that the flash code is being downloaded to the adapter. The *second* light pattern occurs while the adapter is updating the flash code. **Make sure the adapter stays plugged in.** After the adapter goes through its normal start-up tests, it returns to its Ready state.
off	blinking	on	Network error. Check all connections to the network. For example, make sure the network cables are connected.
off	blinking	off	Software error. Turn the printer power off then on to reset the adapter. Then try to re-send the print job. If this error persists, call for service.
on	blinking	on	Flash error. Turn the printer power off then on to reset the adapter. If the error persists, call for service.

Adapter service

If your adapter needs service:

- Make a note of the light pattern, then contact your point of purchase. The adapter contains no replaceable parts and may need to be returned.
- Make sure you don’t send print jobs to a nonexistent adapter. If you do, these print jobs will be stored in the queue.
- If your adapter is defective and you need to replace it, make sure you delete or hold all queues before removing the adapter from the LAN.

APPENDIX

A

Using the printer control panel

Introduction

For your convenience, you can view or change some information about the adapter from the control panel of the printer.

You can use the printer control panel to set the IP address, netmask and/or gateway for TCP/IP networks.

IP protocol settings from the printer control panel

1 **Turn the printer power On (|).**

2 **Use the printer control panel to select one of the following settings.** Consult your printer documentation to learn the menu path for your specific printer, or scroll through the control panel menus until you find it.

For further details on the use of the printer control panel see the corresponding chapter in the Printer User´s Manual.

3 **Press *READY* to return to ready status.**

Table A.1 IP Protocol

Menu Item	Values	Description
Enable BOOTP	Yes No	Using this menu item, you can set BOOTP on or off. You should select *No* if you have set the IP address, netmask, and/or gateway through the printer's control panel and you want these settings to always apply to this adapter. You should select *Yes* if you want the adapter to automatically find its BOOTP server to get its IP address, netmask, and/or gateway.
Set IP Address	IP Address	Using this menu item, you can set the IP address directly on the printer's control panel. When you do, be sure to set Enable BOOTP to *No*. If Enable BOOTP is set to *Yes* and you turn the printer off and on again, the adapter will search for a BOOTP server and will use the address stored in that file instead of this address.*NOTE
Set IP Netmask	IP Netmask	Using this menu item, you can set the IP netmask directly through the printer's control panel. When you do, be sure to set Enable BOOTP to *No*. If Enable BOOTP is set to *Yes* and you turn the printer off and on again, the adapter will search for a BOOTP server and will use the netmask stored in that file instead of this one.*NOTE The default IP netmask is: 255.255.255.0
Set IP Gateway	IP Gateway	Using this menu item, you can set the IP gateway directly through the printer's control panel. When you do, be sure to set Enable BOOTP to *No*. If Enable BOOTP is set to *Yes* and you turn the printer off and on again, the adapter will search for a BOOTP server and will use the gateway stored in that file instead of this one.*NOTE The default IP gateway is: 0.0.0.0

Note 1: If you're not using a boot server you can have the *bootp* function in the adapter disabled.

Note 2: If a bootp server becomes available *and* someone has entered this adapter's MAC address into the server, then these values are being set by bootp, not via the control panel.

GLOSSARY

G

Glossary

This glossary contains terms specific to local area networks (LANs) and the use of the Network adapters.

A

adapter address. The manufacturer's identification, or the user-defined identification, of an adapter. The adapter address is sometimes also used as the default nickname or login name.

B

BOOTP. See *BOOTstrap protocol (BOOTP)*.

BOOTstrap Protocol (BOOTP). A TCP/IP protocol that enables a workstation to find its IP address.

D

data stream. Print data and control information flowing from a host system (computer) to the printer, from beginning to end without interruption.

DLC protocol (Data Link Control). A set of rules used by two nodes on a data link to accomplish an orderly exchange of information.

E

Ethernet. A network with a bus topology that uses carrier sense multiple access with collision detection (CSMA/CD). An Ethernet network may be installed using any of three cabling systems: Ethernet 10BASE-T (using telephone twisted pair); Ethernet 10BASE2 (using RG-58 coax and also referred to as Cheapernet or Thinnet); Ethernet 10BASE5 (using AUI cable).

F

file server. A computer on your network that runs the operating system software. The software controls the communication among computers attached to the network and it manages shared resources.

File Transfer Protocol (FTP). A TCP/IP protocol that transfers files from one computer to another. It is usually implemented in application programs. This is considered a better way to send files than TFTP (Trivial File Transfer Protocol) because it uses TCP instead of UDP.

Finger. A TCP/IP protocol that normally displays user information on a host computer. When used with Integrated Network Option, finger displays the status of the printer and the current print job.

firmware. Software that resides in the adapter.

flash memory. A type of ROM (read-only memory) used on all MarkNet adapters. Flash memory can be erased electronically and reprogrammed without your removing the adapter from the printer.

FTP. See *File Transfer Protocol*.

G

gateway. The connector device between many LANs.

H

host. The main computer on a network allowing all computers connected the use of data files or programs installed on it.

I

ICMP. See *Internet Control Message Protocol.*

IEEE 802.3. A standard by the Institute of Electrical and Electronics Engineers (IEEE) for a local area network that uses the CSMA/CD access method. This standard has been popularized by Ethernet local area networks.

Integrated Network Option. The Network adapter and its utilities. This adapter is designed to be installed inside various laser printers and therefore sometimes referred to as Internal Network Adapters.

integrated port. On the Network adapter, the port physically located on the adapter. See also *network port.*

Internet. Worldwide networks connection via Internet routers so that information and services may be shared.

Internet Control Message Protocol (ICMP). An important part of the Internet Protocol, it describes and manages error and control messages.

Internet Protocol (IP). A standard that specifies how packets are passed through networks. It identifies the format of the packet and describes how they should be delivered in a seamless manner. Although it is a separate protocol from TCP, it is often referred to as TCP/IP because both TCP and IP protocols are often used together.

IP. See *Internet Protocol* .

L

LAA. See *Locally Administered Address*.

LAN. See *local area network.*

LAN Connection Utility. An OS/2 utility that resides on a network server used to redirect printer or plotter data from its intended destination to a printer or plotter on a LAN-attached adapter.

LAN segment. Any portion of a LAN that operates independently of, but is connected to, the network by bridges or routers.

local area network (LAN). A computer network located within a limited geographical area of a few hundred meters.

Locally Administered Address (LAA). An address that a network administrator assigns to a network adapter on the LAN. Administrators may assign the adapter any address that they wish (within certain constraints). Many administrators use the LAA to give the adapter a meaningful address in their workplace (for example, assigning the adapter an address that identifies its location).

lpd. Line printer daemon. Allows the use of remote printing functions under TCP/IP. This software registers the print document sent from a computer. It is a background process that runs all the time.

lpd print service. UNIX utility that receives print jobs from remote TCP/IP hosts.

LPT (Line PrinTer). A representation of one of the logical ports (for example, LPT1) on a personal computer.

Management Information Base (MIB). A database used to manage a network and the machines based on RFC 1213, is an example of MIB. The MIB describes information specific to the Network Adapter and the printers.

MIB. See *Management Information Base*.

N

netmask. A bit mask that specifies the local network portion of an IP address, allowing you to logically subdivide a network.

NetWare. A family of LAN operating systems that can join PCs and Apple Macintosh computers. It supports a large number of topologies including Ethernet.

network port. The port physically located on the adapter. It eliminates the need to use the parallel and serial ports on the printer. The network port is used to connect to a LAN. See also *integrated port*.

network printer. A printer used on a network. In this guide, it refers to a printer connected to an adapter, receiving jobs as they are sent to the printer by the adapter.

Network Printer Utility. A user interface that allows you to configure print servers and the adapter settings to the network.

nickname. A name that a network administrator assigns to the adapter. It is used to identify the location of the printer.

NLM. Novell NetWare Loadable Module. An optional process used by Novell NetWare 3.11 to add functions to a file server.

O

OS/2. Operating System/2, a multitasking operating system from IBM.

P

packet internet groper (PING). Software that tests whether an IP destination can be reached by sending an ICMP echo request and waiting for a reply.

PCONSOLE. Novell NetWare Print Console software. PCONSOLE allows you to control network printing, establish print servers, and set up print queues.

PING. See *packet internet groper (PING)*.

Print Monitor Utility. In a Windows NT environment it routes print jobs from the server's Print Manager program to the printer. In an OS/2 environment, redirects print jobs from the network to the adapter. This utility includes the basic information for installing and configuring your adapters.

print queue. A directory in the server where print jobs are stored for printing.

print server. Hardware or software (or a combination of hardware and software) that takes information from a print queue and sends it to a printer.

protected directory. A directory guarded by security software. Access is allowed only with the proper password.

protocol. A set of rules managing the communication and transfer of data between two or more network devices.

PSERVER. A Novell NetWare printing service that takes a print job and sends it to a printer assigned to a supported queue. The adapter in PSERVER mode takes the place of the Novell PSERVER process and directs print jobs from a file server queue to a printer attached to the adapter.

R

remote printer. A printer attached to a workstation on a LAN that is set up to work as a shared network printer.

requester. A workstation that requests access to shared resources, such as printers or plotters, so that they appear to be running on the user's own workstation even though they may be running somewhere on the LAN.

RPRINTER. A terminate-and-stay-resident (TSR) program that runs on a Novell workstation. This program allows a printer locally attached to the workstation (instead of the file server) to be used as a shared network printer.

The adapter in the RPRINTER mode emulates the TSR that would normally run on the Novell workstation. The adapter in RPRINTER mode is used in conjunction with the Novell PSERVER utility to direct print jobs to a printer attached to the adapter. This method does not use any Novell user login slots.

S

SAP. See *service access point*

server. A device that allows people using LAN workstations to share resources such as printers/plotters on the network.

service access point (SAP). In Open Systems Interconnection architecture, the point at which the services of a layer are provided by an entity of the next higher layer.

Simple Network Management Protocol (SNMP). A TCP/IP protocol that defines how computers will exchange management information.

SNMP. See *Simple Network Management Protocol*.

spooler. An intercepting program that prevents output from different sources or workstations from interfering with each of them.

T

TCP. See *Transmission Control Protocol (TCP)*.

TCP/IP. See *Transmission Control Protocol/Internet Protocol*.

TFTP. See *Trivial File Transfer Protocol*.

Transmission Control Protocol (TCP). The standard protocol that resides at the transport layer. After two computers establish a connection, TCP provides a reliable, full duplex, stream service that allows one computer to send data to another.

Therefore, many operating systems implement TCP; they also implement the IP protocol to send data across the underlying internet. Although TCP is a separate protocol from IP, it is often referred to as TCP/IP because both TCP and IP protocols are often used together.

Transmission Control Protocol/Internet Protocol (TCP/IP). The TCP and IP protocols, used together.

Trivial File Transfer Protocol (TFTP). A TCP/IP protocol that transfers files with minimum overhead and no guarantee of delivery.

U

UAA. See *Universally Administered Address (UAA)*.

UDP. See *User Datagram Protocol (UDP)*.

Universally Administered Address (UAA). An adapter's UAA is the factory-set default address. Network administrators may choose to set a locally administered address (LAA) for the adapter so that its address is more meaningful to their workplace.

User Datagram Protocol (UDP). The protocol that allows one computer to send a datagram (unit of data) to another. It uses the IP protocol to deliver datagrams. UDP datagrams include a protocol port number so that the sending computer can differentiate among several destinations on the remote computer.

utility. The software that came on the diskettes respectively CD-ROM with this guide.

V

VAP. Value added process. An optional process used by Novell NetWare 2.2 to add functions to a file server.

Z

zone. In AppleTalk, the grouping of network devices in a logical manner so that they may be easily accessed by the user.

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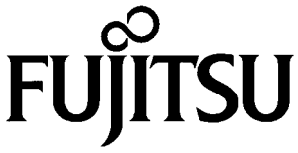
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